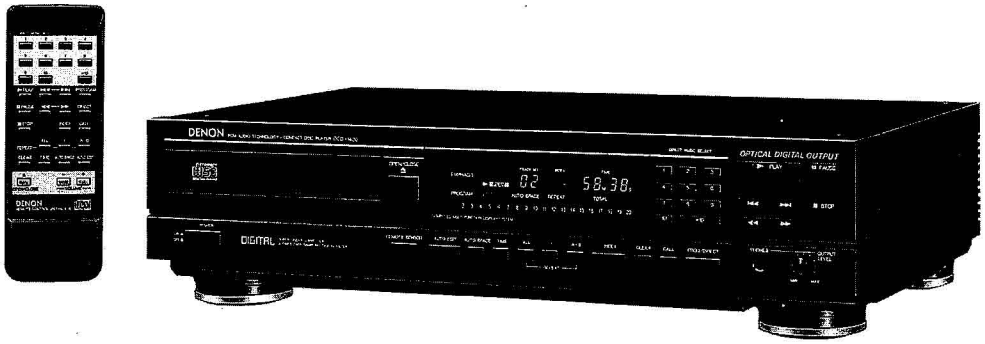
DENON

Hi-Fi Component

SERVICE MANUAL

STEREO CD PLAYER

MODEL DCD-1400



NIPPON COLUMBIA CO., LTD.

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FEATURES

The DCD-1400 compact laser disc player utilizes a unique DENON Super Linear Converter which prevents deterioration of sound quality in the PCM playback system, assuring accurate reproduction of sound record on compact laser discs, in the studio or in live sound production areas. The parts for this high performance disc player have been selected with careful discrimination, to produce high quality, realistic playback of the full musical production.

(1) **Double Super Linear Converter**
This unique, DENON converter system prevents the zero-cross distortion that causes deterioration in PCM reproduction quality. The result is perfect reproduction of concert hall quality.

(2) **Built-in High Performance Digital Filter**
Independent digital-analog converters are used on the left and right channels of the DCD-1400, and a high precision digital filter with quadruple oversampling is used, as well as a built-in LC-OFC analog filter. These filters make clear reproduction with good rise possible.

(3) **Remote control unit with variable volume**
In addition to the Play, Pause, Stop and Direct Select function using the 10 key pad on the remote control unit, it is also possible to vary the volume with the (+) and (—) keys. The remote control function greatly improves the ease of use of the DCD-1400 player.

(4) **Digital OUT is an optical output device**
This device outputs information from a compact disc in digital form, making it possible to play music with an external digital processor or Digital-to-Analog unit. In addition to coaxial output, an optical output device is also provided, eliminating the interference of noise and improving audio quality.

(5) **Anti-vibration Consturction**
A double top cover, anti-vibration weighted bottom, sintered alloy insulators has been used to improve the anti-vibration effects.

(6) **8-cm CD software, to be introduced in the future, can be used.**
8-cm CD's can be played without the use of an adapter.

SPECIFICATIONS

AUDIO

No. of channels:	2 channels
Frequency response:	2 ~ 20,000 Hz
Dynamic range:	96 dB
Signal-to-noise ratio:	103 dB
Harmonic distortion:	0.0035% (1 kHz)
Separation:	100 dB (1 kHz)
Wow and flutter:	Less than the measuring limit (±0.001% W. peak)
Output voltage:	2.0 V (VARIABLE 0V ~ 2.0V)

DISCS Audio Compact discs are used.

GENERAL CHARACTERISTICS

Power supply:	50/60 Hz, voltage is shown on rating label
Power consumption:	17 W
Dimensions:	434 (17.1 in) W x 112 (4.4 in) H x 314 (12.4 in) D mm
Weight:	6.3 kg

FUNCTIONS AND DISPLAY

Functions:	Direct selection, automatic search, programmed selection, repeat playback, manual search, auto space, time mode, call, auto edit.
Display:	Track number, index number, time, program and direct, etc.
Other functions:	Headphone jack (variable level)

REMOTE CONTROL UNIT RC-205

Remote control system:	Infrared pulse system
Power supply:	3 V DC Two SUM-4 (standard size AAA) dry cell batteries
External dimensions:	60 (2.4 in) W x 165 (6.5 in) H x 17 (0.7 in) D mm
Weight:	95 g (Includes batteries)

ACCESSORIES Connecting pin cord

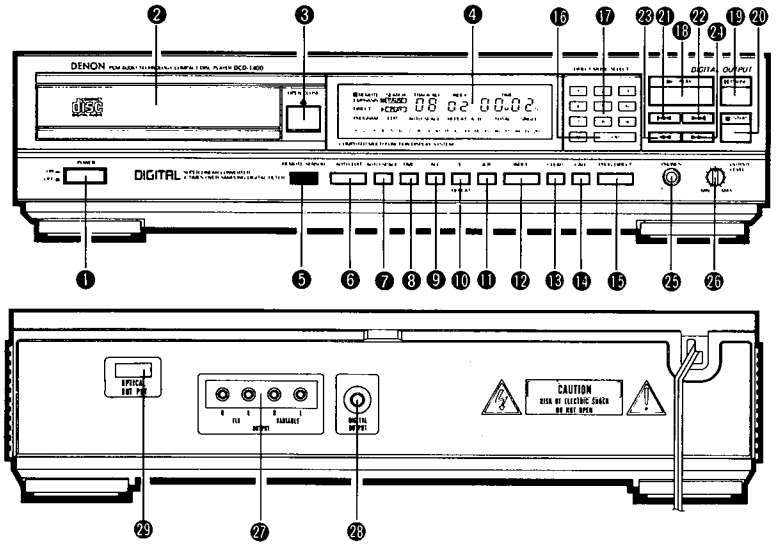
* Design and specifications are subject to change without notice in the course of product improvement.

VAROITUS: SUOJAKOTELOA EI SAA AVATA. LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ SILMILLE VAARALLISTA LASERSÄTEILYÄ.

ADVARSEL: USYNLIG LASERSTRALING VED ABNING NAR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGA UDSAETTELSE FOR STRALING.

"CLASS 1 LASER PRODUCT"

NAMES AND FUNCTIONS OF PARTS



❶ Power Switch (POWER)

- Press this switch to turn the power source ON.
- (00) lights up in the TRACK NO. display when the power is turned on. If no disc is loaded, then after a few seconds, the digital display and DIRECT indicator, together with the calendar, lights up.
  If a disc is loaded, after a few seconds, the total number of tracks on the disc is displayed in the TRACK NO. display and the total disc playing time is displayed in the TIME display, the calendar lights up until the total number of tracks is displayed, then play begins.

❷ Disc Holder

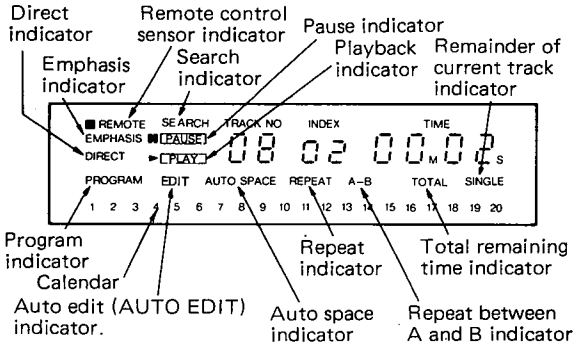
- The disc is loaded into the disc holder for play.
- The disc holder is opened and closed by pressing the disc holder open/close button (▲ OPEN/CLOSE) ❸.
- It can also be closed by pressing the play button (▶ PLAY) ⓲ or pause button (⏸ PAUSE) ⓳.

❸ Disc Holder Open/Close Button (▲ OPEN/CLOSE)

- The disc holder ❷ is opened and closed by pressing this button.
- Press the button once to eject the disc holder ❷ forward. Press it again to close the holder.
- If the disc holder is closed and a disc has been loaded, the disc is rotated for several seconds, and then the total number of tracks on the disc and the total playback time are then displayed on the digital display ❹.

❹ Display

- The display area consists of sections for the track number, the index, the playback time, and the calendar.



❺ Remote Control Photosensitive Window

- This window receives the light transmitted from the wireless remote control unit.
- The RC-205 wireless remote control unit should be operated while it is pointed in the direction of the photosensitive window.
- When the remote control is operated, the remote control sensor indicator lamp will light in the display area ❹.

❻ Auto Edit Button (AUTO EDIT)

- This is an automatic program function which divides the tracks of a one-sided compact disc into two halves, Side A and Side B, like the two sides of an analog disc. The tracks of the compact disc are divided at the break between tracks which is nearest to the middle of the disc, based on total playing time.
- The [EDIT] indicator lights up when this key is pressed in the stop state. First, the playing time for the first half of the disc is displayed and the number of tracks is displayed in the Calendar indicator. Next, the same information is displayed for the second half of the disc. After that, the player automatically goes to the start of the 1st track and waits in the Pause state. Start play by pressing either the Play or the Pause button. After the first half of the disc is played, the player pauses automatically at the start of the 1st track of the second half of the disc. Start play again by pressing the Play or the Pause button. Play will stop automatically at the end of the second half of the disc. The [EDIT] indicator will also go off at this time.
- This function operates only when a disc with 20 or fewer tracks is played. Since the program mode is entered automatically, tracks cannot be selected directly.
- The [EDIT] indicator gose off when the AUTOMATIC SEARCH, MANUAL SEARCH, STOP, CLEAR, and PROGRAM/DIRECT buttons are pressed, and all operation is canceled.
- Since there is a difference between the playing time information recorded on the disc and the total time of the different tracks, the time indication (total playing time) when the player is stopped may differ from the total of the first half playing time and second half playing time displayed during Auto Edit (by about 2 seconds).

⑦ Auto Space Button (AUTO SPACE)

- Pressing this button will cause the [AUTO SPACE] indicator to light up and a blank portion lasting 4 or more seconds to be inserted between the tracks. If this button is pressed while the [AUTO SPACE] indicator is lit, the lamp will go off and the auto space function will be cancelled.
- When the AUTOMATIC SEARCH button (⏮, ⏭) is pressed, the auto space function will not operate.
- The auto space function will operate with programmed playback as well as normal playback.
- Although a blank interval is inserted between tracks when the Auto Space function is operating, the 4-second interval is not added to the time remaining display or to the time display during Auto Edit.

⑧ Time Mode Button (TIME)

- This button is used to select the type of information to be read out under the TIME section of the display. Either the elapsed playback time of the current track, the remaining playback time for that track, or the playback time for the remaining tracks on the disc can be selected.
  Normally the elapsed playback time of the current track is displayed. If the button is pressed once, the [SINGLE] indicator lights and the remaining time left to play on the track is displayed. If the button is pressed again, the [SINGLE] indicator goes off, and the [TOTAL] indicator goes on, and the playback time for the remaining tracks left on the disc is displayed. If the button is pressed once more, the [TOTAL] indicator goes off and the display returns to the elapsed playback time for that track.
  If the button is pressed so that the [TOTAL] indicator lights during programmed playback, the playback time for all of the remaining programmed tracks is displayed.

⑨ Repeat All Tracks Button (ALL)

- Press this button to repeat playback.
- When the [ALL] button is pressed, the [REPEAT] indicator lights and repeated playback is performed for all of the tracks on the disc. During programmed playback, all of the tracks programmed into memory are played repeatedly. Press the [ALL] button again to cancel the repeat operation.

⑩ One Track Repeat Button (1)

- Press this button when desiring to replay 1 track only. Pressing this button while a track is playing will cause the player to replay that track only.

⑪ A-B Repeat Button (A – B)

- Press this button to perform repeated playback of a desired section between two specified points.

⑫ Index Button (INDEX)

- Press this button when playing from the index within the tracks. Specify the index No. from the ten key pad.

⑬ Clear Button (CLEAR)

- Use this key to make corrections in the programmed tracks.

⑭ Call Button (CALL)

- Press this button to verify the track numbers that have been programmed into memory.

⑮ Program and Direct Button (PROG/DIRECT)

- Press this button to select the memory program function or direct track selection function.

⑯ +10 Button (+10)

- Press this button to select a track number that is larger than 11.
- The [+10] button is used in conjunction with the ten-key pad ⑰. For example, to select track number 15, press the [+10] button and then [5] on the ten-key pad.
- Similarly, to select track number 30, press [+10], [+10] and then press [+10].

⑰ Ten-key Pad (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

- These buttons are pressed for direct track selection or to program a selection into memory. For example, to play back the third track using the direct selection function, press [3] on the key pad. Track number 3 will then start to play. To play track number 12, press [+10] and then [2].
- To use the keypad in program mode, first press the (PROG/DIRECT) button ⑮ to enter the correct mode.

⑱ Play Button (▶ PLAY)

- Press this button to play a disc.
- When the PLAY button is pressed, the [▶PLAY] indicator lights, and the number of the track being played, the index number, and the elapsed playback time for that track are displayed. The calendar lights to display the all of the playback tracks. The displayed tracks then go off in order as each finishes playing.
- When playback of the last track has finished, the [▶PLAY] indicator goes off, and the machine enters stop state.
- It is also possible to use the PLAY button to close the disc holder after a disc has been inserted. Playback then begins.

⑲ Pause Button (⏸ PAUSE)

- Press this button to stop the playback temporarily.
- If the PAUSE button is pressed during playback, the play is stopped temporarily, the [▶PLAY] indicator goes off, and the [⏸PAUSE] indicator lights.
- To end the pause, push the PLAY button ⑱ or PAUSE button ⑲ again.

⑳ Stop Button (■ STOP)

- Press this button to stop the playback.
- The rotation of the disc stops, and the total number of tracks and the total playback time are read out on the TRACK NO, and TIME sections of the display.
- During to be program, the total number of tracks programmed in memory and the total programmed performance time are displayed.

㉑ Automatic Search Reverse Button (⏮)

- Press this button to move the pickup backward, to return to the beginning of the desired track.
- If this button is pressed during playback or pause, the pick-up moves backward to the begining of the track that corres-corresponds to the number of times the button was pressed.

㉒ Automatic Search Forward Button (⏭)

- Press this button to move the pickup forward to advance to the beginning of the desired track.
- If this button is pressed during playback or pause, the pick-up moves forward to the beginning of the track that corresponds to the number of times the button was pressed.

㉓ Manual Search Reverse Button (◀◀)

- Press this button to move playback in fast reverse.
- When the machine is in play, sound will be produced during the time that the button is being pressed and the fast reverse is operating.
- If the button is pressed while the machine is in the pause state, the fast reverse will operate three times faster than the reverse speed when the machine is in the play state. No sound will be produced.

㉔ Manual Search Forward Button (▶▶)

- Press this button to move playback in fast forward.
- Whe the machine is in play, sound will be produced during the time that the button is being pressed and the fast forward is operating.
- If the button is pressed while the machine is in the pause state, the fast forward will operate three times faster than the fast forward speed when the machine is in the play state. No sound will be produced.

㉕ Headphone Jack (PHONES)

- When using headphones, please listen to them at an appropriate volume. (Headphones are sold separately.)

㉖ Volume Adjustment Knob

- Use when adjusting the output level (VOLUME) of the Headphone and Line Out (VARIABLE).
- The accessory wireless remote control unit (RC-205) can also be used to operate the player.

㉗ Output Terminal (FIX-VARIABLE)

- Connect the output terminal to the input terminal of the amp.

㉘ Digital Output Terminal (DIGITAL OUTPUT)

- This terminal outputs digital data.

㉙ Digital Output Terminal (OPTICAL OUTPUT)

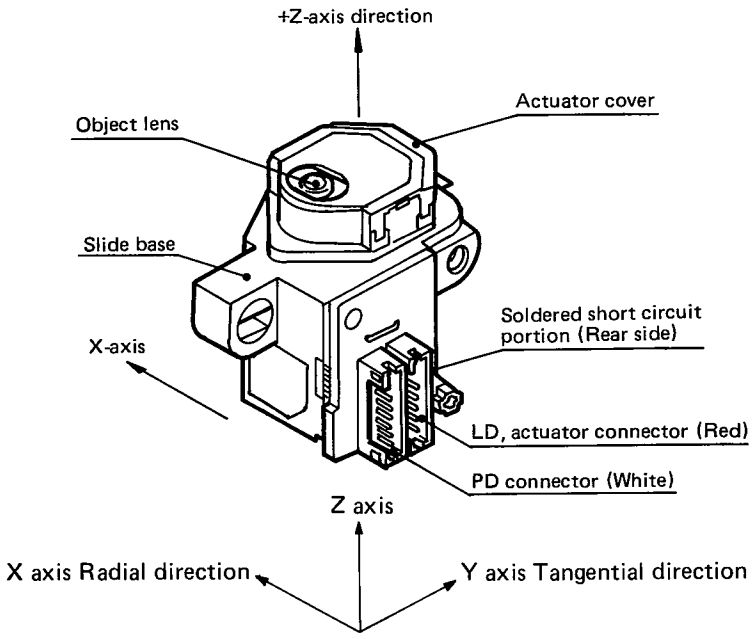
- This terminal outputs digital data optically.
- Please contact at your local DENON Service Network concerning the optical fiber cord to be connected.

Continuous Operation

Holding ㉑ Automatic Search, Reverse Button, ㉒ Automatic Search, Forward Button, ⑬ Call Button and ⑯ +10 key down starts continuous operation.

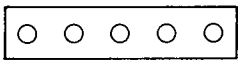
NOTE FOR HANDLING OF LASER PICK-UP

DESCRIPTION OF THE COMPONENTS



Label

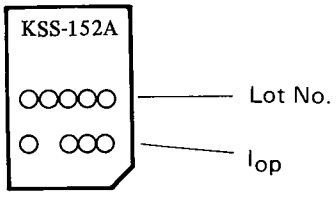
1. Serial number



This denotes the serial number used for quality control in the manufacturing plant.

Note: The numbers of figures in English numerals may be changed.

2. Label



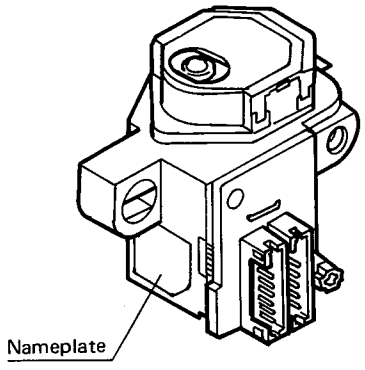
year
(last figure)
day month | quality control No.
○○ ○ ○ ○

but Oct. Nov. and Dec. are expressed by alphabetical letters of X, Y and Z.

10 1 10^{-1}
quality control ○ ○ ○ ○
LD drive current

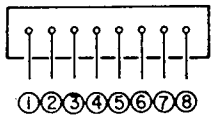
The expressed unit is by mA, with omission of the decimal point as for example, 56.5 mA will be expressed as 565, but the head of English letter means the control in the manufacturing plant.

3. Position of the labels



ELECTRICAL PIN CONNECTION

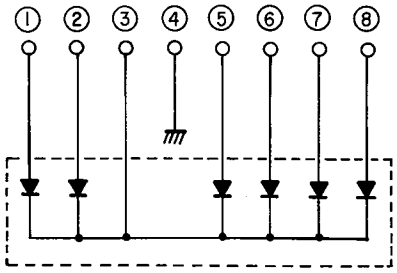
1. PD connector (JAPAN SOLDERLESS TERMINAL MFG CO. LTD "PH series" 8 pin)



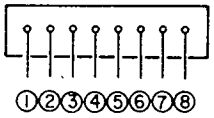
COLOR : WHITE

Pin No.	PD element
①	F
②	E
③	K
④	GND
⑤	A
⑥	B
⑦	C
⑧	D

PC Circuit Diagram



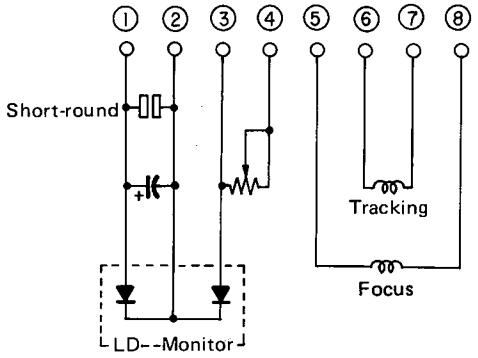
2. Actuator & LD connector (JAPN SOLDERLESS TERMINAL, MFG CO. LTD "PH series" 8 pin)



COLOR : RED

Pin No.	description
①	Laser
②	GND
③	monitor
④	reference
⑤	Fo (-)
⑥	Tr (+)
⑦	Tr (-)
⑧	Fo (+)

LD · Actuator Circuit Diagram



Cautions for Handling the Laser Pick-up

The laser pick-up KSS-152A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Do not disassemble or attempt to readjust it. Please keep the following instructions carefully in handling pick-up.

1. Handle with Care

(1) Storage
Do not store the pick-up in dusty, high-temperatured or high-humidity environments.

(2) Please take care for preventing from shock by falling down or careless handling.

2. Laser Diode (LD)

(1) Protect your eyes
The laser beam may damage the human eye, since the intensity of the focused spot may reach 7×10^3 W/cm^2 even if the intensity at the objective lens is 400 μW maximum. As the light beam spreads after focused through the objective lens, it does not effect you in the place as far as more than 30 cms. However, do not look at the laser light beam either through the objective lens directly nor another lens or a mirror.

(2) Poison of As
Since the LD chip contains As (Arsenic), as GaAs + GaAlAs, as known as the poison, although the poison is relatively weak, in comparing with others, e.g. As_2O_3, $AsCl_3$ etc., and the amount is small, avoid putting the chip in acid or an alkali solution, heating it over 200°C or putting it into your mouth.

(3) Avoid surge current or electrostatic discharge
The LD may be damaged or deteriorated by it's own strong light if a large current is supplied to it, even if only a short pulse.
Make sure that there is no surge current in the LD driving circuit by switches or else. Be careful to handle pick-up as it may be damaged in a moment by human electrostatic discharge. The pins of the LD are short-circuited by solder for protection during shipment.
For safety handling of an LD, grounding the human body, measuring equipments and jig is strongly recommended. And still it is further desirable to make use of mat on the platform and floor for handling the LD.
To open the short circuit, remove the soldering quickly with a soldering iron whose metal part is grounded. The temperature of the soldering iron should be less than 320°C (30W).

3. Actuator Cover

(1) The performance of the actuator may be effected if magnetic material is located nearby, since the actuator has a strong magnetic circuit. Do not permit dust to enter through the clearance of the cover.

(2) Cleaning the lens
It may change the specifications by attaching dust or ash on the object lens. Clean the lens with a cleaning paper dampened a little water, not pressing lens with so much strength by the cleaning paper.

4. Metal Bearing

As the metal bearing of Cu-compound sintered alloy is impregnated with Sankoru "FG-84" (by the Daido Fatty Oil Company made), never fail to supply the bushing with the same lubricant at the time of replacing the pick-up.

5. Handling

Please handle the laser pick-up with holding the slide base (rosin molded part).
When either a part of human body or some other things may happen to touch directly with the circuit part of P.W. Board, it may cause deterioration, take careful attention in handling this base.

6. Deterioration

When difficulty occurs either in focus or tracking adjustment nor able to adjust the focus or tracking, it seems that the laser pick-up is deteriorated. In these cases, check a value of laser diode current and give a decision for deterioration.

7. Fundamental Deterioration Decision of Laser Pick-up

(1) If a voltage value in between No. 2 and No. 6 pins of TP102 of the servo and signal processor unit, the value of laser diode current "iop" can be found by a formula "iop1" = $\frac{V1}{22}$.

(2) If an "iop" exceeds ±10% compared with the IOP indication on the laser pick-up nameplate, there is a fair chance for deterioration when it is checked under a circumambient temperature 23°C.

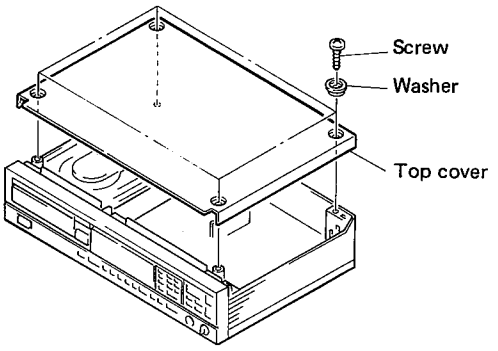
(3) When the circumambient temperature changes ±10°C, "iop1" will change ±5%. The "iop1" will also be changed by the passage of time.

(4) In case of the above conditions taking into consideration and performed the adjustment in proper way, if the HF level at pin No. ① of TP102 on Main Unit, and in between GND4 becomes 1V or laser values; or a jitter occurs great, the laser pick-up may be deteriorated.

DISASSEMBLY

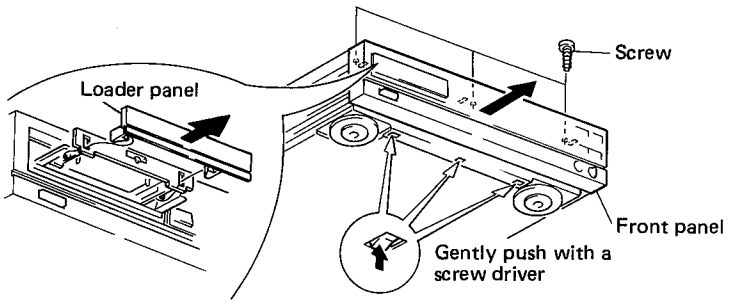
• Top Cover

Remove 4 upper screws.



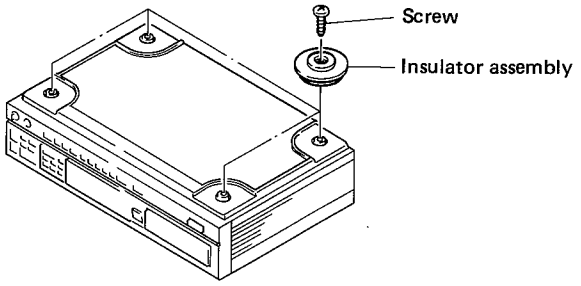
• Front Panel

(1) Undo 2 hooks and detach loader panel.
(2) Remove 3 front panel upper screws.
(3) Undo 3 front panel upper hooks.
(4) Pull front panel and undo 3 lower hooks.



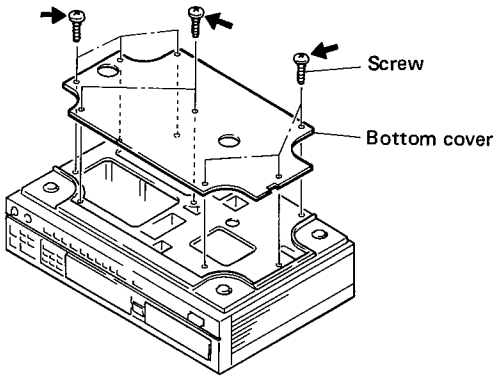
• Insulator Assembly

Remove 4 screws.



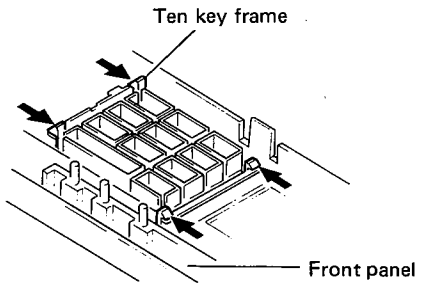
• Bottom Cover

Remove 8 screws arrow show.



• Window and Ten Key Frame

Gently push hooks to arrow direction from front panel rear side, and push up the frame.



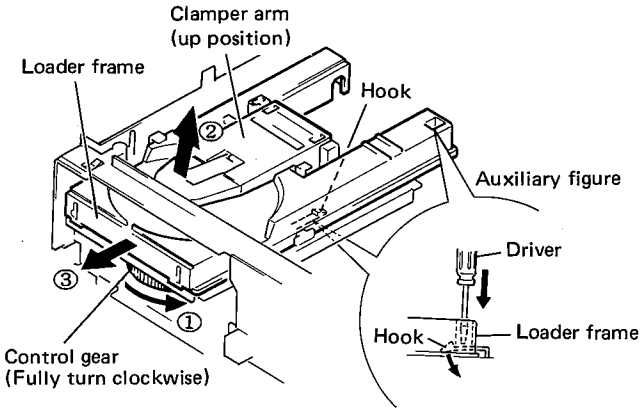
• Operation Key

Operation key comprises Ten Key assembly, knob cap assembly, manual knob assembly, OP/CL knob assembly, Knob series, which can be easily detached from the front panel rear side.

DISASSEMBLY OF MECHANISM UNIT

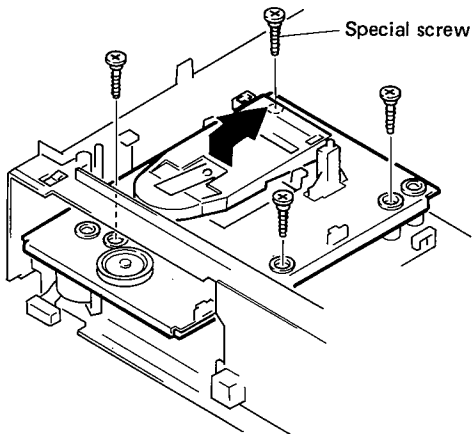
• Mechanism Unit (FG-760)

(1) Pull looder frame in ①, ②, ③ other, and undo base plate hook as per auxiliary figure.



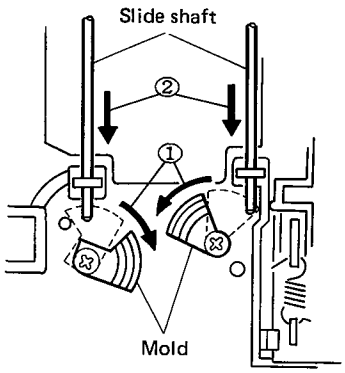
(2) Remove 4 special screws, rise it to arrow direction, and then pull backward.

(Caution) When remove the unit, be sure to take power cord off. Also, use list ring connected to ground via 1 MegΩ resistor. Never touch laser P.U. If it is necessary to remove wire from laser P.U. be sure to shortcircuit (solder bridge) the laser.



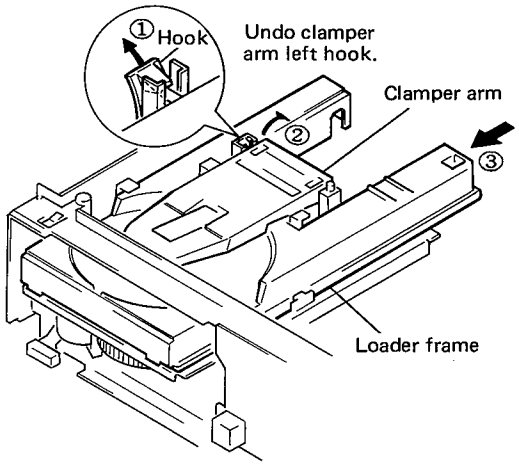
• Slide Shaft

Turn mold part to arrow ① direction with fingers or a ⊕ screw driver, and pull to arrow ② direction.



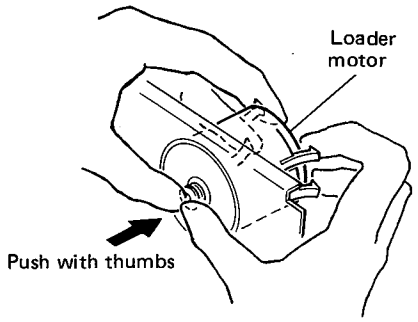
• Loader Frame (when loader motor does not turn)

Undo clamper arm hooks in ①, ② order, push it to arrow ③ direction, and undo base plate hook. (refer to mechanism unit disassembly)



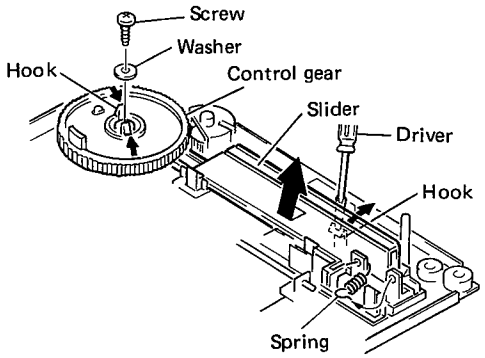
• Loader Motor

Remove belt, push 4 hooks outward with both hands, and push motor shaft to arrow direction with thumbs.



• Slider

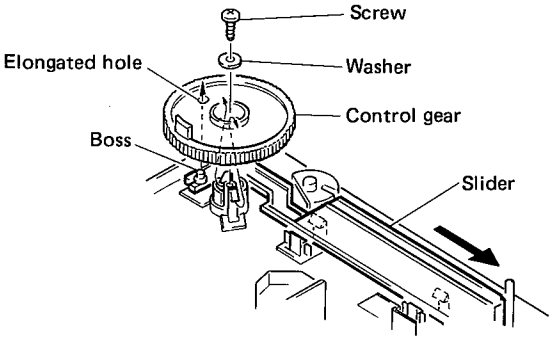
(1) Remove control gear by detaching a screw and a hook.
(2) Remove 2 springs fitting top and bottom side of the base plate.
(3) Remove a hook on the right center of the base plate with ⊖ driver to the arrow direction.
(4) Pull out slider upward tilting to the arrow direction.



ASSEMBLY

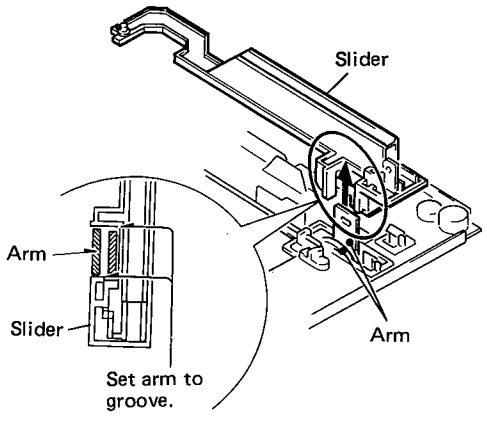
• Control Gear

Pull slider to arrow direction, set slider boss to elongated hole, and do a screw.



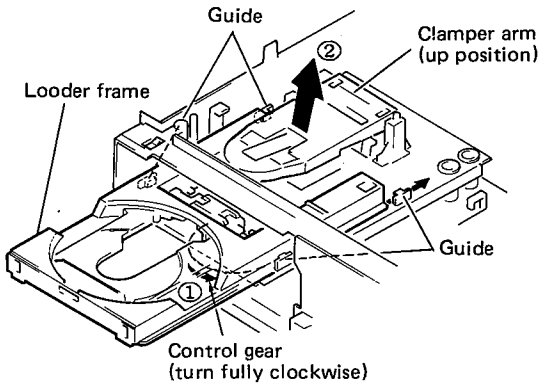
• Slider

Use care so that two arms of clamper arm seat in slider groove. Install the slider after clamper arm fixed.



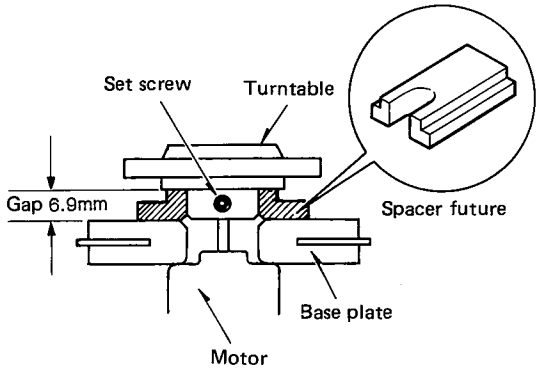
- **Loader Frame**

Set clamper arm to up position in arrow ①, ② order, and push it along base plate guide.



TURNTABLE HEIGHT ADJUSTMENT

Insert spacer fixture (6.9 mm) between base plate and turntable, and fasten set screw.



ADJUSTMENT

Microcomputer built in the unit, comprises service program to facilitate servo adjustment by pushing operation button.

1. Start service program

(1) Turn power switch OFF.
(2) Shortcircuit pins ③, ④ of connector (TP102) on P.W.B. (Main Unit)
(Caution) Do not touck other pins.
(3) Turn power switch ON.
(Service program starts, and displays track number 01)

(Caution)
- When service program started normal operation of buttons will be defeated.

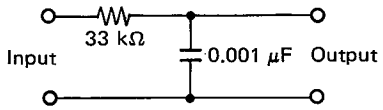
2. Service program function

Button	Function	Description
⏏ OPEN/CLOSE	Opens or closes the disc holder.	• Opens or closes only when disk is stopped. • Operate other keys after open or close .
■ STOP	Stops system function.	• Displays track number 01 . • Push when adjustment completed, or do it again.
▶ PLAY	Starts focus servo and disk turns.	• Push when adjust tracking offset. • When completed, displays track number 02 .
❚❚ PAUSE	Starts focus servo, tracking servo, slide servo, spindle servo.	• When PLAY button is pushed, starts tracking servo and slide servo. • When completed, track number 03 .
Other button	No normal operation.	• Do not operate buttons other than above. • If misoperated, immediately turn power switch OFF.

(Caution)
- Do not use remote control during service program mode.

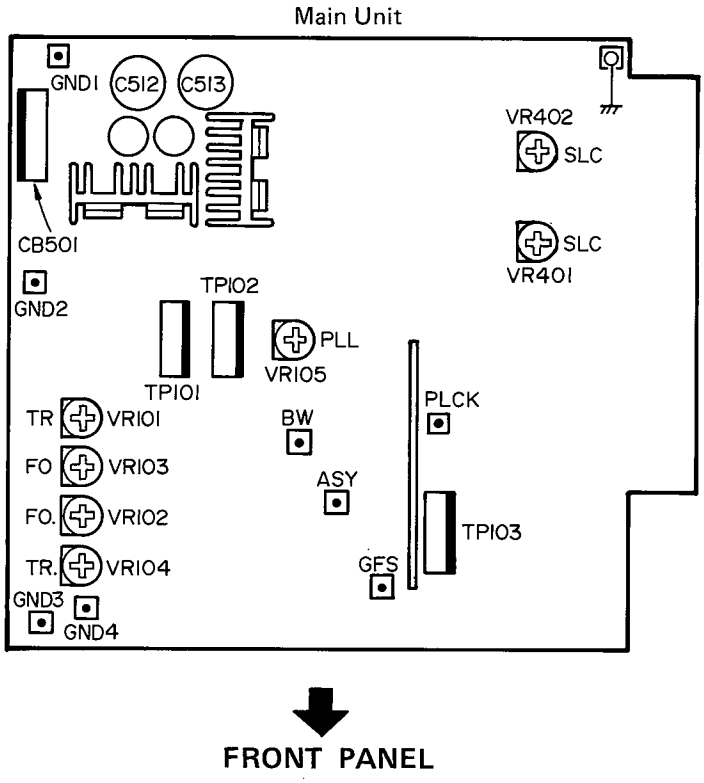
3. Adjustment

(1) Prior to start adjustment
Before adjusting laser P.U. and spindle motor, be sure adjust turntable height at the time of turntable assembly.
(2) Necessary equipment for adjustment
1 Dual trace oscilloscope
2 Reference disk
3 Oscillator (10 Hz ~ 10 kHz, 0 ~ 3 Vp-p)
4 Frequency counter (readable more than 5 MHz)
5 Filter for measurement



(Filter for measurement)

(3) Location

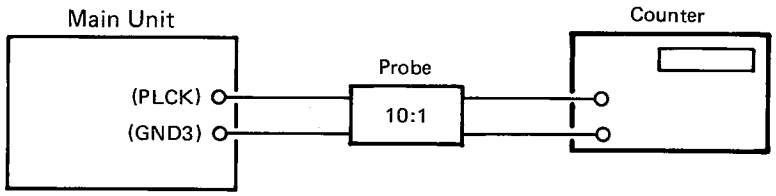


(4) Preset

1.	Start service program.	
2.	Preset VR101 ~ 105 as per left figure.	VR101 (T-OFFSET) 7 O'clock VR105 (PLL) 9 O'clock VR103 (F-OFFSET) 9 O'clock VR102 (F-GAIN) 8 O'clock VR104 (T-GAIN) 9 O'clock
3.	Step.	1. PLL 2. Tracking offset 3. Focus gain 4. Focus offset 5. Tracking gain 6. Tracking offset recheck.

4. PLL Adjust

Connection

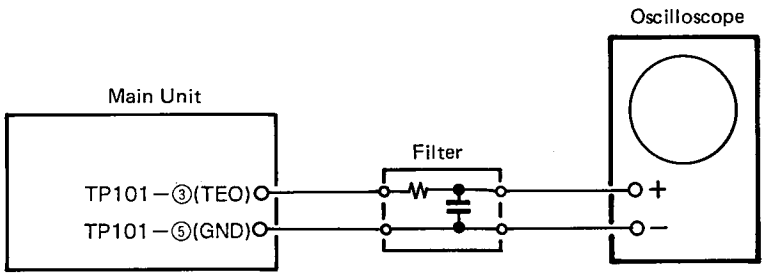


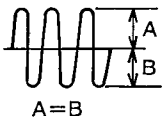
- Ground Test point [ASY] [BW] to GND1.

Adjust	Check	Step
(Volume)	(Counter)	• Turn PLL volume VR105 so that frequency counter reads 3.5 MHz.
VR105	3.5 MHz ± 10 kHz	

5. Tracking offset

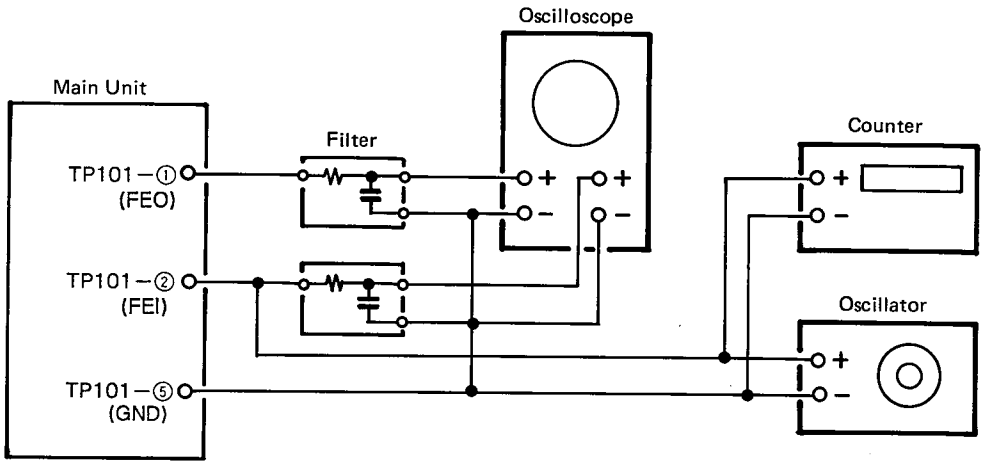
Connection

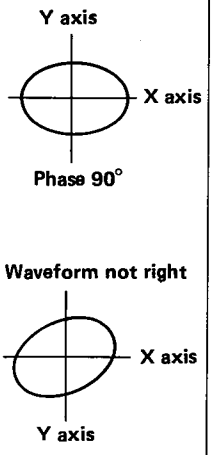


Oscilloscope (DC range)		Adjust	Check	Step
V	H	(Volume)	(Oscilloscope)	1. Push ▲ OPEN/CLOSE and load disk holder reference disk. 2. Push ▲ OPEN/CLOSE and close disk holder. 3. Push ▶ PLAY to turn disk. 4. Short (+) (-) of oscilloscope and check the base line. 5. Adjust VR101 [T-OFFSET] to equalizer upper and lower amplitude of the waveform.
0.1V/div	1 ~ 2 ms	VR101	 A=B	

6. Focus gain

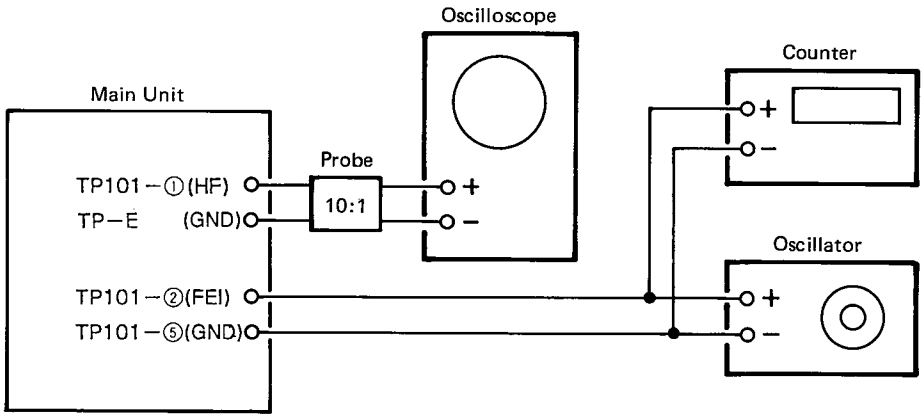
Connection

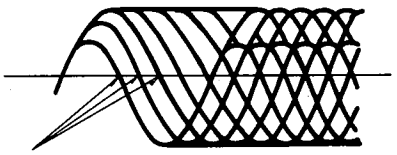
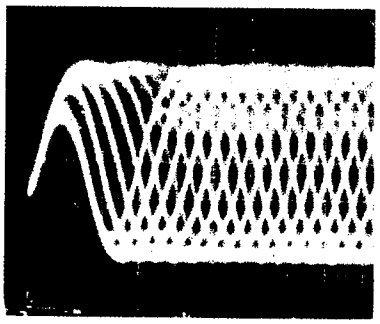


Oscillator	Counter	Oscilloscope V	Oscilloscope H	Adjust	Check	Step
690 Hz 1 Vp-p (±0.1 V) (Note 630 Hz CA1094 disk used)	690 Hz (Note 630 Hz CA1094 disk used)	• DC range • X-Y mode		VR102		1. Push [II PAUSE]. 2. Set oscillator to 690 Hz/1 Vp-p. 3. Switch oscilloscope input to X-Y mode. 4. Adjust VR102 [F-GAIN] to symmetrize Lissajous figures to X and Y axes.

7. Focus offset

Connection



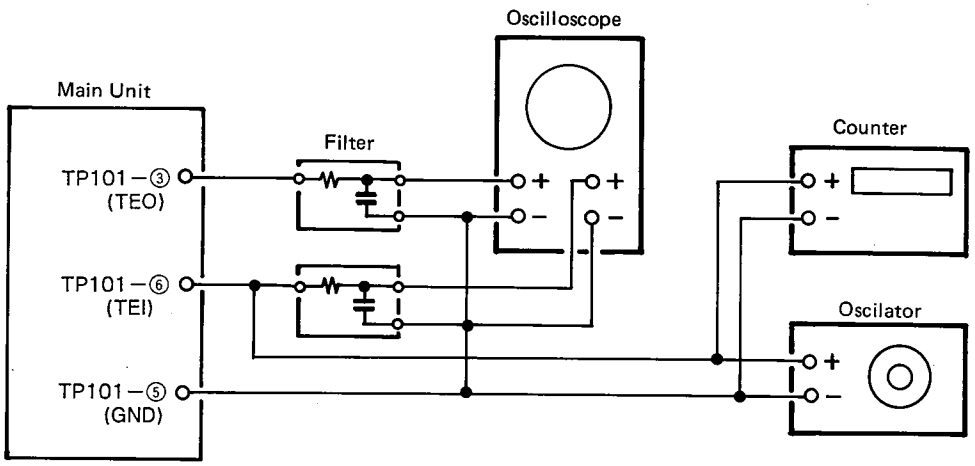
Oscillator	Counter	Oscilloscope		Adjust	Check
		V	H	(Volume)	(Oscilloscope)
690 Hz 1 Vp-p (±0.1 V)	690 Hz	50 mV/div or 20 mV/div	0.2 μ/div or 0.5 μ/div	VR103	 Adjust to minimize pattern jitter.  Pattern
		• Set input mode to ALTERNATE or CHOPPER.			

Step

1. Push [II PAUSE].
2. Set oscillator to 690 Hz, 1 Vp-p (±0.5 V).
3. VR103 [F-OFFSET] to minimize pattern jitter.

8. Tracking gain

Connection



• Caution: Connect oscillator after [II PAUSE] pushed and servo function started.

Oscillator	Counter	Oscilloscope V	Oscilloscope H	Adjust	Check	Step
		V	H	(Volume)	(Oscilloscope)	1. Push [II PAUSE].
• 1.7 kHz (±120 Hz) • 2 Vp-p (±0.1V) (1.45 kHz CA1904 disk used)	1.7 kHz (±120 Hz) (1.45 kHz CA1094 disk used)	• DC range • X-Y mode		VR104	Y axis / X axis / Phase 90°	2. Connect oscillator. 3. Set oscillator to 1.7 kHz/2 Vp-p. 4. Switch oscilloscope input to X-Y mode. 5. Adjust VR104 [T-GAIN] to symmetrize Liseajous figures to X-Y axes.

9. Tracking offset adjustment check

(1) Adjust tracking offset again.
(2) Push [■STOP] and stop disk.
(3) Push [▶PLAY] and check disk turns.
Note: If disk does not turn, push [▶ PLAY] again and check track number 02 is diasplayed.
(4) Check oscilloscope waveform upper and lower amplitude are same to base line.
(5) Push [■STOP] and stop disk.
(6) Push [▲OPEN/CLOSE] and remove the reference disk.

HEAT RUN MODE FUNCTION

Heat Run Mode

1) To activate

While hold pushing 1,4,7 and 10 keys of the 10-KEY simultaneously, turn the unit power on. The remote control sensor indicator will light to show that the unit is shifted in Heat Run mode.
Be sure to load the disc previously.
Press the disc holder open/close button (▲OPEN/CLOSE) to cancel Heat Run mode.
Never push the PAUSE button.

2) Operation

During the Heat Run mode to shift the unit in Play mode makes the unit replays from the first music after opens the loader once and re-closes it when finish playing the last track (comes into lead out).
Hereafter, operates open/close of loader, servo on, reading of TOC, and playing repeatedly. For a disc with more than 30 tracks, repeat playing the two tracks; the first and the last ones.

3) Error Message

When the system error occurs while in Heat Run mode, the following error message will display on the Track No. indicator and stops operation.

1. E1
   At the time of Focus Servo does not activate.
2. E2
   When unable to detect synchronous pattern however the disc is in rotating. (GFS does not drive.)
3. E3
   No synchronous pattern can be detected while in Play mode. (No GFS drives.)
4. E4
   When TOC is unreadable in despite of servo is activated.
5. E5
   In case of loader malfunctions. (Unable to turn on the switch.)
6. E6
   The inner circle switch of Pick-up does not turn off.
7. E7
   The inner circle switch of Pick-up does not turn on.

★ Also, displays the number of operation up to this time on the Time (Min.) indicator. (16th numeration system.)

Decimal system	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16th numeration system	0 1 2 3 4 5 6 7 8 9 A B C D E F
16th unmeration system indiaction	0 1 2 3 4 5 6 7 8 9 - [ ] o E

Lower part of 8 ↗ ↖ No indication

IC TERMINAL FUNCTION LIST

• Remote Control IC (LU59001) Terminal Function List

Terminal No.	Function	Terminal No.	Function
1	Serial Data Output	11	Remote Control Code Input Input Code for Remote Control out of QH3031
2	+5 V		
3	Shift Clock Input	12	System Address GND Earth
4	RDY Output	13	System Address GND Earth
5	+5 V	14	System Address GND Earth
6	455 kHz OSC	15	System Address GND Earth
7	455 kHz OSC	16	GND
8	– GND Earth	17	+5 V
9	ACL Input	18	System Address +5 V
10	GND	19	+5 V
		20	VDD +5 V

CXA1081S Terminal Function

Terminal No.	Terminal Symbol	I/O	DC voltage (V)	Terminal Function
1	RFI	I	0	Input terminal of capacitance coupled RF summing amplifier output.
2	RFO	O	V_{RFO}	Terminal for RF summing amplifier output. Check point of Eye pattern.
3	RF(–)	I	0	Feedback input terminal of RF summing amplifier.
4	P/N	I	0 (VC)	P-sub/N-sub shifting terminal for Laser Diode (LD). (DC voltage: at N-sub.)
5	LD	O	-1.8	Output terminal of APC (Automatic Power Control) LD amplifier. (DC voltage: at N-sub, PD opened.)
6	PD	I	0	Input terminal of APC (Automatic Power Control) PD amplifier. (DC voltage: opened.)
7	PD1	I	0	Reverse input terminal of RF I-V amplifier (1). Receives a input current through A + C terminals of photo diode.
8	PD2	I	0	Reverse input terminal of RF IV amplifier (2). Receives a input current through B + D terminals of photo diode.
9	VC	–	0	At ± dual-power supply: Becomes GND. At mono-power supply: Becomes VR. (connect to pin 14.)
10	F	I	0	Reverse input terminal of F I-V amplifier. Receives a input current through F terminal of photo diode.
11	E	I	0	Reverse input terminal of E I-V amplifier. Receives a input current through E terminal of photo diode.
12	EO	O	0	Output terminal of E I-V amplifier.
13	EI	I	0	Feedback input terminal of E I-V amplifier. For gain controlling of E I-V amplifier.
14	VR	O	V_{CVO}	Output terminal of DC voltages $(V_{CC} + V_{EE})/2$.
15	CC2	I	1.0	Input terminal of capacitance coupled defect bottom hold output.
16	CC1	O	1.2	Output terminal of defect bottom hold.
17	V_{EE}	–	-2.5	At ± dual-power supply: Becomes negative power supply terminal. At mono-power supply: Becomes GND.
18	FE BIAS	I	0	Bias terminal for non-reverse side of focus error amplifier. For CMR controlling of focus error amplifier.
19	FE	O	V_{FEO}	Output terminal of focus error amplifier.
20	TE	O	V_{TEO}	Output terminal of tracking error amplifier.
21	DEFECT	O	V_{DFCTL}	Output terminal of defect comparator. (DC voltage: Connect a 10 kΩ load resistance.)
22	MIRR	O	V_{MIRL}	Output terminal of MIRR comparator. (DC voltage: Connect a 10 kΩ load resistance.)
23	CP	I	-1.3	Connecting terminal for MIRR hold capacitor. Non-reverse input terminal of MIRR comparator.
24	CB	I	0	Connecting terminal for defect bottom hold capacitor.
25	D GND	–	-2.5	At ± dual-power supply: GND. At mono-power supply: GND (V_{EE}).
26	ASY	I	–	Input terminal of auto-asymmetry control.
27	EFM	O	V_{EFMH}	Output terminal of EFM comparator. (DC voltage: Connect a 10 kΩ load resistance.)
28	FOK	O	V_{FOKL}	Output terminal of focus OK comparator. (DC voltage: Connect a 10kΩ load resistance.)
29	$\overline{\text{LD ON}}$	I	-2.5 (D GND)	ON/OFF shifting terminal for laser diode (LD). (DC voltage: At LD ON.)
30	V_{CC}	–	2.5	Positive power supply terminal.

CXA1082AS Terminal Function

Terminal No.	Terminal Symbol	Terminal Function
2	DFCT	Defect signal input terminal. Defect measure circuit activates at "H".
3	TE	Tracking error signal input terminal.
4	TZC	Tracking zero cross comparator input terminal.
5	ATSC	Input terminal of ATSC detecting window comparator.
6	FE	Focus error signal input terminal.
8	FGD	In case of reducing higher range gain of focus servo, connect a capacitor between this terminal and terminal number (9).
9	FS3	Shifts higher range gain of focus servo by FS3 ON/OFF.
10	FLB	Terminal for external time constant to increase lower range of focus servo.
11	FEO	Focus drive output.
12	FE(–)	Reverse input terminal for focus amplifier.
13	SRCH	Terminal for external time constant to make focus search waveform.
14	TGU	Terminal for external time constant to shift higher range gain of tracking.
15	TG2	Terminal for external time constant to shift higher range gain of tracking.
17	TAO	Tracking drive output.
18	TA(–)	Reverse input terminal for tracking amplifier.
19	SL(+)	Non-reverse input terminal of sled amplifier.
20	SLO	Sled drive output.
21	SL(–)	Reverse input terminal of sled amplifier.
22	SSTOP	Terminal for limit switch ON/OFF to detect disc inner most circle.
23	FSET	Terminal to compensate peak in focus tracking phase, and for setting fo in CLV LPF.
24	SENS	Terminal to output FZC, AS, TZC, SSTOP, $\overline{\text{BUSY}}$ by command from CPU.
26	C. OUT	Terminal to output signal for track number count.
27	DIRC	Terminal is used at the time of 1 track jump. A 47 kΩ pull up resistor is included.
28	XRST	Reset input terminal. Resets at "L".
29	DATA	Serial data input from CPU.
30	XLT	Latch input from CPU.
31	CLK	Serial data transfer clock input from CPU.
33	BW	Terminal for external time constant of loop filter.
34	PDI	Input terminal of PDO for CXD1125 phase comparator.
35	ISET	Delivers a current to set the height of focus search, track jump, and sled kick.
36	VCOF	Resistance value between this terminal and terminal (37) is nearly proportion to VCO free-run frequency.
38	C864	Output terminal of 8.46 MHz VCO.
39	LOCK	Reckless drive protection circuit activates at "L". A 47 kΩ pull up resistor is included.
40	MDP	Terminal to connect MDP terminal of CXD1125.
41	MON	Terminal to connect MON terminal of CXD1125.
42	Fsw	Terminal for external LPF time constant of CLV servo error signal.
43	SPDL(–)	Reverse input terminal for spindle drive amplifier.
45	SPDLO	Spindle drive output.
46	WDCK	Clock input for auto-sequence. Normally applied 88.2 kHz.
47	FOK	FOK signal input terminal.
48	MIRR	MIRR signal input terminal.

CDX1125Q Terminal Function

Terminal No.	Terminal Symbol	I/O	Terminal Function
1	FSW	O	Output to shift time constant of output filter for spindle motor.
2	MON	O	ON/OFF control output for spindle motor.
3	MDP	O	Drive output for spindle motor. Rough control at CLV-S mode and phase control at CLV-P mode.
4	MDS	O	Drive output for spindle motor. Speed control at CLV-P mode.
5	EFM	I	Input of EFM signal from RF amplifier.
6	ASY	O	Output to control slice level of EFM signal.
7	LOCK	O	Sampling GFS signal by WFCK/16 and if it is "H", delivers "H"; if it is continuously "L" 8 times, delivers "L".
8	VCOO	O	VCO output. When EFM signal is locked, f=8.4672 MHz.
9	VCOI	I	VCO input.
10	TEST	I	(0V).
11	PDO	O	Phase comparing output for EFM signal and VCO/2.
12	Vss	–	GND (0V).
13	CLK	I	Serial data transfer clock input from CPU. Latches data by rising edge of clock.
14	XLT	I	Input of Latch from CPU. Latches 8-bit shift register data (serial data from CPU) to each register.
15	DATA	I	Input of serial data from CPU.
16	XRST	I	System reset input. Resets at "L".
17	CNIN	I	Input of tracking pulse.
18	SENS	O	Answer to address, output internal condition.
19	MUTG	I	Input of muting. When internal register A's ATTM is in "L", and MUTG is in "L" for normal condition; "H" for no sound condition.
20	CRCF	O	Output of CRC check result of sub-code Q.
21	EXCK	I	Clock input for serial output of sub-code.
22	SBSO	O	Serial output of sub-code.
23	SUBQ	O	Q output of sub-code.
24	SCOR	O	Output of sub-code sync. S0 + S1.
25	SQCK	I/O	Reading clock of sub-code Q.
26	SQEX	I	Selection input of SQCK.
27	DOTX	O	Digital out output. (When CXD1130Q or DO is OFF, output $\overline{\text{WFCK}}$.)
28	GFS	O	Output of indication for frame sync lock condition.
29	DB08	I/O	Data terminal of external RAM. DATA8 (MSB).
30	DB07	I/O	Data terminal of external RAM. DATA7.
31	DB06	I/O	Data terminal of external RAM. DATA6.
32	DB05	I/O	Data terminal of external RAM. DATA5.
33	V_{DD}	–	Power supply (+5V).
34	DB04	I/O	Data terminal of external RAM. DATA4.
35	DB03	I/O	Data terminal of external RAM. DATA3.
36	DB02	I/O	Data terminal of external RAM. DATA2.
37	DB01	I/O	Data terminal of external RAM. DATA1 (LSB).
38	RA01	O	Address output of external RAM. ADDR01 (LSB).
39	RA02	O	Address output of external RAM. ADDR02.
40	RA03	O	Address output of external RAM. ADDR03.
41	RA04	O	Address output of external RAM. ADDR04.
42	RA05	O	Address output of external RAM. ADDR05.
43	RA06	O	Address output of external RAM. ADDR06.
44	RA07	O	Address output of external RAM. ADDR07.
45	RA08	O	Address output of external RAM. ADDR08.

Terminal No.	Terminal Symbol	I/O	Terminal Function
46	RA09	O	Address output of external RAM. ADDR09.
47	RA10	O	Address output of external RAM. ADDR10.
48	RA11	O	Address output of external RAM. ADDR11.
49	RAWE	O	Write enable signal output for external RAM. (Active at "L".)
50	RACS	O	Chip select signal output for external RAM. (Active at "L".)
51	C4M	O	Dividing output of X'tal. f = 4.2336 MHz.
52	V_{SS}	–	GND (0V).
53	XTAI	I	X'tal oscillation circuit input. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz.
54	XTAO	O	X'tal oscillation circuit output. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz.
55	MD1	I	Mode selection input 1.
56	MD2	I	Mode selection input 2.
57	MD3	I	Mode selection input 3.
58	SLOB	I	Code switching input for audio data output. At "L" for 2's compliment output; at "H" for offset binary output.
59	PSSL	I	Mode switching input for audio data output. At "L" for serial output; at "H" for parallel output.
60	APTR	O	Control output for aperture compensation. In "H" for R-ch.
61	APTL	O	Control output for aperture compensation. In "H" for L-ch.
62	DA01	O	At PSSL = "H" for DA01 (LSB of parallel voice data) output. At PSSL = "L" for C1F1 output.
63	DA02	O	At PSSL = "H" for DA02 output; PSSL = "L" for C1F2 output.
64	DA03	O	At PSSL = "H" for DA03 output; PSSL = "L" for C2F1 output.
65	DA04	O	At PSSL = "H" for DA04 output; PSSL = "L" for C2F2 output.
66	DA05	O	At PSSL = "H" for DA05 output; PSSL = "L" for C2FL output.
67	DA06	O	At PSSL = "H" for DA06 output; PSSL = "L" for C2PO output.
68	DA07	O	At PSSL = "H" for DA07 output; PSSL = "L" for RFCK output.
69	DA08	O	At PSSL = "H" for DA08 output; PSSL = "L" for WFCK output.
70	DA09	O	At PSSL = "H" for DA09 output; PSSL = "L" for PLCK output.
71	DA10	O	At PSSL = "H" for DA10 output; PSSL = "L" for UGFS output.
72	DA11	O	At PSSL = "H" for DA11 output; PSSL = "L" for GTOP output.
73	V_{DD}	–	Power supply (+5V).
74	DA12	O	At PSSL = "H" for DA12 output; PSSL = "L" for RAOV output.
75	DA13	O	At PSSL = "H" for DA13 output; PSSL = "L" for C4LR output.
76	DA14	O	At PSSL = "H" for DA14 output; PSSL = "L" for $\overline{C21O}$ output.
77	DA15	O	At PSSL = "H" for DA15 output; PSSL = "L" for C21O output.
78	DA16	O	At PSSL = "H" for DA16 (MSB of parallel voice data) output. At PSSL = "L" for DATA output.
79	WDCK	O	Strobe signal output. At DF ON, 176.4 kHz. At CXD1125Q or DF OFF, 88.2 kHz.
80	LRCK	O	Strobe signal output. At DF ON, 88.2 kHz. At CXD1125Q or DF OFF, 44.1 kHz.

Note:

C1F1: ┐ Monitor output for error correction state what C1 is at
C1F2: ┘ decode.

C2F1: ┐ Monitor output for error correction state what C2 is at
C2F2: ┘ decode.

C2FL: Correction state output. Becomes "H" when C2 system in which presently under correction is unable to correct.

C2PO: C2 pointer indication output. Synchronizes with audio data output.

RFCK: Read frame clock output. 7.35 kHz of X'tal system.

WFCK: Write frame clock output. 7.35 kHz when locked on to X'tal system.

$\overline{PLCK}$: VCO/2 output. When locked to EFM signal, f = 4.3218 MHz.

UGFS: Output of unprotected frame sync pattern.

GTOP: Indication output of frame synchro in protected condition.

RAOV: Overflow and underflow indication outputs of ±4 frame jitter absorbing RAM.

C4LR: Strobe signal. At DF ON, 352.8 kHz. At CXD1125Q or DF OFF, 176.4 kHz.

$\overline{C21O}$: Reverse output of C210.

C21O: Bit clock output. At DF ON, 4.2336 MHz. At CXD1125Q or DF OFF, 2.1168 MHz.

DATA: Serial data output of audio signal.

PARTS LIST OF P.W. BOARD

SERVO & SIG. PRO. UNIT (2U-1560/1627)

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC101	2620842002	CXA-1081S	
IC102	2620843001	CXA-1082AS	
IC103,104	2630257001	M5218P	
IC301	2620922003	HD63A05Y048P	
IC302	2630423000	M51953B	
IC303	2620745002	HD74HC42	
IC304~306	2630298002	LB1240	
IC307	2620635002	LU59001	
IC308	2620632005	BA6208A	
IC401	2620844026	SM5807EP	
IC402	2620739005	TC74HCU04P	
IC403	2620729002	HD74HC08P	
IC404,405	2620836005	PCM56P-J	
IC406~408	2620419008	HD14053BP	
IC409,410	2630360008	NE5532	
IC411	2630198005	NJM4556D	
IC501	2680047009	NJM7805A	
IC502	2630501003	NJM79M05FA	
IC503,504	2680055004	ICP-F15	
IC506	2630467008	HA17812W	
IC507	2630539004	NJM79M12FA	
TR101	2720025004	2SB562(C)	
TR102	2740123009	2SD1985(P/Q)	
TR103	2720085002	2SB941A(Q/P)	
TR104	2740060002	2SD468(C)	
TR105	2720025004	2SB562(C)	
TR106	2740060002	2SD468(C)	
TR107	2720025004	2SB562(C)	
TR108	2740060002	2SD468(C)	
TR109	2720025004	2SB562(C)	
TR110	2740060002	2SD468(C)	
TR111	2720025004	2SB562(C)	
TR112	2690038901	RN1210(4.7k--)T	
TR301	2690025901	RN1202(10k-10k)T	
TR302,303	2690026900	RN2202(10K-10k)T	
TR304	2690025901	RN1202(10k-10k)T	
TR401,402	2740124008	2SD1504(E/F)	
TR403,404	2710101022	2SA933(Q)	
TR501	2720025004	2SB562(C)	
D301~306	2760370007	1SS106	
D307	2760049008	1S2076	
D401~404	2760236031	HZ5C-1	
D501,506	2760405008	S1WB(A)10	
D502	2760224014	HZ30-2	
D503	2760303003	HZ6C-2	
D504,505	2760427905	DSA1A2(TYPE2)	
RESISTOR GROUP			
R105	2452033908	RN14K2E360G	36Ω ¼W
R106	2542038903	RN14K2E560G	56Ω ¼W

Ref. No.	Part No.	Part Name	Remarks
VR101,102	2116064051	V06PB203	20kΩ
VR103	2116064006	V06PB103	10KΩ
VR104	2116064051	V06PB203	20kΩ
VR105	2116064064	V06PB102	1kΩ
VR401,402	2116064022	V06PB104	100kΩ
VR403	2110513207	V1620V30FA103M	10kΩ (With Motor)
CAPACITOR GROUP			
C101	2544260061	CE04W1H3R3M(SME)	3.3μF/50V
C102	2544252237	CE04W1A101M(SME)	100μF/10V
C103	2533614000	CC45SL1H300J	30pF/50V
C104	2551120055	CQ93M1H272J	0.0027μF/50V
C105	2561034018	CF93A1H333J	0.033μF/50V
C106	2544252037	CE04W1A101M(SME)	100μF/10V
C107	2531024003	CK45F1H103Z	0.01μF/50V
C108	2544260032	CE04W1HR47M(SME)	0.47μF/50V
C109,110	2551121025	CQ93M1H103J	0.033μF/50V
C111	2551120068	CQ93M1H332J	0.0033μF/50V
C112	2544252037	CE04W1A101M(SME)	100μF/10V
C113	2531024003	CK45F1H103Z	0.01μF/50V
C114	2533645008	CC45SL1H561J	560pF/50V
C115	2544252037	CE04W1A101M(SME)	100μF/10V
C116	2531024003	CK45F1H103Z	0.01μF/50V
C118	2551121067	CQ93M1H223J	0.022μF/50V
C119	2561034018	CF93A1H333J	0.033μF/50V
C120	2561035017	CF93A1H224J	0.22μF/50V
C121,122	2544260061	CE04W1H3R3M(SME)	3.3μF/50V
C123	2551121025	CQ93M1H103J	0.01μF/50V
C124	2544252037	CE04W1A101M(SME)	100μF/10V
C125	2531024003	CK45F1H103Z	0.01μF/50V
C126	2561034076	CF93A1H104J	0.1μF/50V
C127	2551121025	CQ93M1H103J	0.01μF/50V
C128	2544254019	CE04W1C220M(SME)	22μF/16V
C129	2533610004	CC45SL1H200J	20pF/50V
C130	2544260045	CE04W1H010M(SME)	1μF/50V
C131	2533627000	CC45SL1H101J	100pF/50V
C132	2533636004	CC45SL1H241J	240pF/50V
C133	2533603008	CC45SL1H100D	10pF/50V
C134	2543055905	CE04D1V4R7MBP (SME)	4.7μF/35V
C135	2561034076	CF93A1H104J	0.1μF/50V
C136	2533627000	CC45SL1H101J	100pF/50V
C137	2534342041	CC45SL1H050C	5PF/50V
C138	2561034076	CF93A1H104J	0.1μF/50V
C139	2561034092	CF93A1H154J	0.15μF/50V
C141	2551121025	CQ93M1H103J	0.01μF/50V
C142,143	2539036006	CK45=1E104Z	0.1μF/25V
C144	2531024003	CK45F1H103Z	0.01μF/50V
C145	2531004007	CK45B1H102K	1000pF/50V
C146	2551120042	CQ93M1H222J	0.0022μF
C147	2551120097	CQ93M1H562J	0.0056μF/50V
C301	2544260029	CE04W1HR33M(SME)	0.33μF/50V
C302	2544252037	CE04W1A101M(SME)	100μF/10V

Ref. No.	Part No.	Part Name	Remarks
C303	2531024003	CK45F1H103Z	0.01 μF/50V
C304,305	2533635005	CC45SL1H221J	220pF/50V
C308	2544254022	CE04W1C330M(SME)	33 μF/16V
C309	2533627000	CC45SL1H101J	100pF/50V
C312	2544252037	CE04W1A101M(SME)	100 μF/10V
C313,314	2531024003	CK45F1H103Z	0.01 μF/50V
C318	2533627000	CC45SL1H101J	100pF/50V
C319	2531024003	CK45F1H103Z	0.01 μF/50V
C320	2544252037	CE04W1A101M(SME)	100 μF/10V
C321	2531024003	CK45F1H103Z	0.01 μF/50V
C322	2544252037	CE04W1A101M(SME)	100 μF/10V
C323	2531024003	CK45F1H103Z	0.01 μF/50V
C324～326	2544252037	CE04W1A101M(SME)	100 μF/10V
C330,331	2551121025	CQ93M1H103J	0.01 μF/50V
C332	2531024003	CK45F1H103Z	0.01 μF/50V
C333	2531002009	CK45B1H471K	0.047 μF/50V
C338	2539036006	CK45=1E104Z	0.1 μF/25V
C340	2539036006	CK45=1E104Z	0.1 μF/25V
C341,342	2544261015	CE04W1H470M(SME)	47 μF/50V
C343	2531027000	CK45F1H104Z	0.1 μF/50V
C401,402	2531024003	CK45F1H103Z	0.01 μF/50V
C403	2544252037	CE04W1A101M(SME)	100 μF/10V
C404	2533627000	CC45SL1H101J	100pF/50V
C405,406	2531024003	CK45F1H103Z	0.01 μF/50V
C407,408	2544254064	CE04W1C331M(SME)	330pF/16V
C409,410	2531024003	CK45F1H103Z	0.01 μF50V
C411,412	2554210098	CQ09P1H471J	470pF/50V
C413～416	2544254064	CE04W1C331M(SME)	330 μF/16V
C417,418	2551134038	CQ92M1H223J	0.022 μF/50V
C419,420	2554219921	CQ09P1H821J	820pF/50V
C421,422	2554219989	CQ09P1H152J	0.0015 μF/50V
C423,424	2554220923	CQ09P1H222J	0.0022 μF/50V
C425～428	2533614000	CC45SL1H300J	30pF/50V
C429,430	2531024003	CK45F1H103Z	0.01 μF/50V
C431,432	2543060738	CE04W1H101MBPC (AWF)	100 μF/50V
C433	2544256091	CE04W1E222M(SME)	2000 μF/25V
C434	2544256059	CE04W1E221M(SME)	220 μF/25V
C435～442	2531024003	CK45F1H103Z	0.01 μF/50V
C443	2539036006	CK45=1E104Z	0.1 μF/25V
C444	2533603008	CC45SL1H100D	10pF/50V
C445,446	2531002009	CK45B1H471K	470pF/50V
C447,448	2531024003	CK45F1H103Z	0.01 μF/50V
C449,450	2539036006	CK45=1E104Z	0.1 μF/25V
C455,456	2531024003	CK45F1H103Z	0.01 μF/50V
C457	2539036006	CK45=1E104Z	0.1 μF/25V
C501,502	2544255704	CE04W1C332MC (SME)	3300 μF/16V
C503～505	2544254064	CE04W1C331M(SME)	330 μF/16V
C506～508	2539036006	CK45=1E104Z	0.1 μF/25V
C509	2544262070	CE04W1J470MT (SME)	47 μF/63V
C510	2544260045	CE04W1H010M(SME)	1 μF/50V
C511	2544261028	CE04W1H101M(SME)	100 μF/50V
C512,513	2544190050	CE04W1H332MC (AWD)	3300 μF/50V

OTHER PARTS GROUP

FB301,302	2350023007	Inductor	
FB303～305	2350049900	INDUCTOR	
FB306,307	2350023007	INDUCTOR	
	2350044002	LOW PASS FILTOR	
L302	2350016904	INDUCTOR	
	2124388004	TACT SWITCH	
	4990088002	REMOTE CONTROL RECEIVER	
X301	3990069006	CST 6.00MT	
X302	2610037005	CSB 455E	
X303	3990036013	CRYSTAL (16.9344MHz)	
	4170297008	HEAT SINK	IC506
	4170307008	HEAT SINK	IC501
	2318060002	PULSE TRANSFORMER	
	2048256005	1P PIN JACK	
	2048261003	4P PIN JACK	
	3934046001	FL TUBE	
	2048209007	H/P JACK	
	4140424005	SHIELDED PLATE(A)	
	2690052000	TOTX172	OPTICAL OUTPUT
CB101	2050321083	8P CONNECTOR BASE	
CB102	2050271081	8P PHCONNECTOR BASE	
CB103,307	2050322037	3P CONNECTOR BASE	
CB106,402	2050321038	3P CONNECTOR BASE	
CB107, 108,401	2050271036	3P PHCONNECTOR BASE	
CB109,403	2050323036	3P CONNECTOR BASE	
CB308	2050154030	3P NHCONNECTOR BASE	
CB501	2050190094	9P NHCONNECTOR BASE	
CN308	2050419034	3P SQCONNECTOR(S)	
TP101～103	2050190065	6P NHCONNECTOR BASE	

KU-5862 DIGITAL SIG. PRO UNIT

IC1	2620736008	CXD1125	
IC2	2620673006	HM6116FP-4	
C3	2539036006	CK45=1E104Z	0.1 μF/25V
C4	2544254051	CE04W1C221M(SME)	220 μF/16V

⚠KU-578B/D FILTER UNIT (Europe/U.K.)

Ref. No.	Part No.	Part Name	Remarks
C521～523	2538014003	CK45F2GAC103M	0.01 μF/400VAC
CH501	2398019002	LINE FILTER COIL	
	2123323002	POWER SW	
	2042267003	9P NH-SCN CONNECTOR CORD	
	4150299000	CONDENSER COVER	
F1	2061031032	FUSE	(0.16A)
	2020022008	FUSE HOLDER	
F2,3	2061015003	FUSE	(500mA)

⚠KU-578C LINE FILTER UNIT (U.S.A. model)

Ref. No.	Part No.	Part Name	Remarks
C521～523	2538014003	CK45F2GAC103M	0.01 μF/400VAC
CH501	2398019002	LINE FILTER COIL	
	2123323002	POWER SW	
	2042267003	9P NH-SCN CONNECTOR CORD	

⚠KU-578E LINE FILTER UNIT (Asia) model)

Ref. No.	Part No.	Part Name	Remarks
C521～523	2538014003	CK45F2GAC103M	0.01 μF/400VAC
CH501	2398019002	LINE FILTER COIL	
	2123323002	POWER SW	
	2042267003	9P NH-SCN CONNECTOR CORD	
F1	2061015003	FUSE	(500mA)
	2020022008	FUSE HOLDER	
	5138254037	FUSE LABEL	
	2050217045	4P CON. BASE (ULTR)	

⚠KU-578F LINE FILTER UNIT (Australia model)

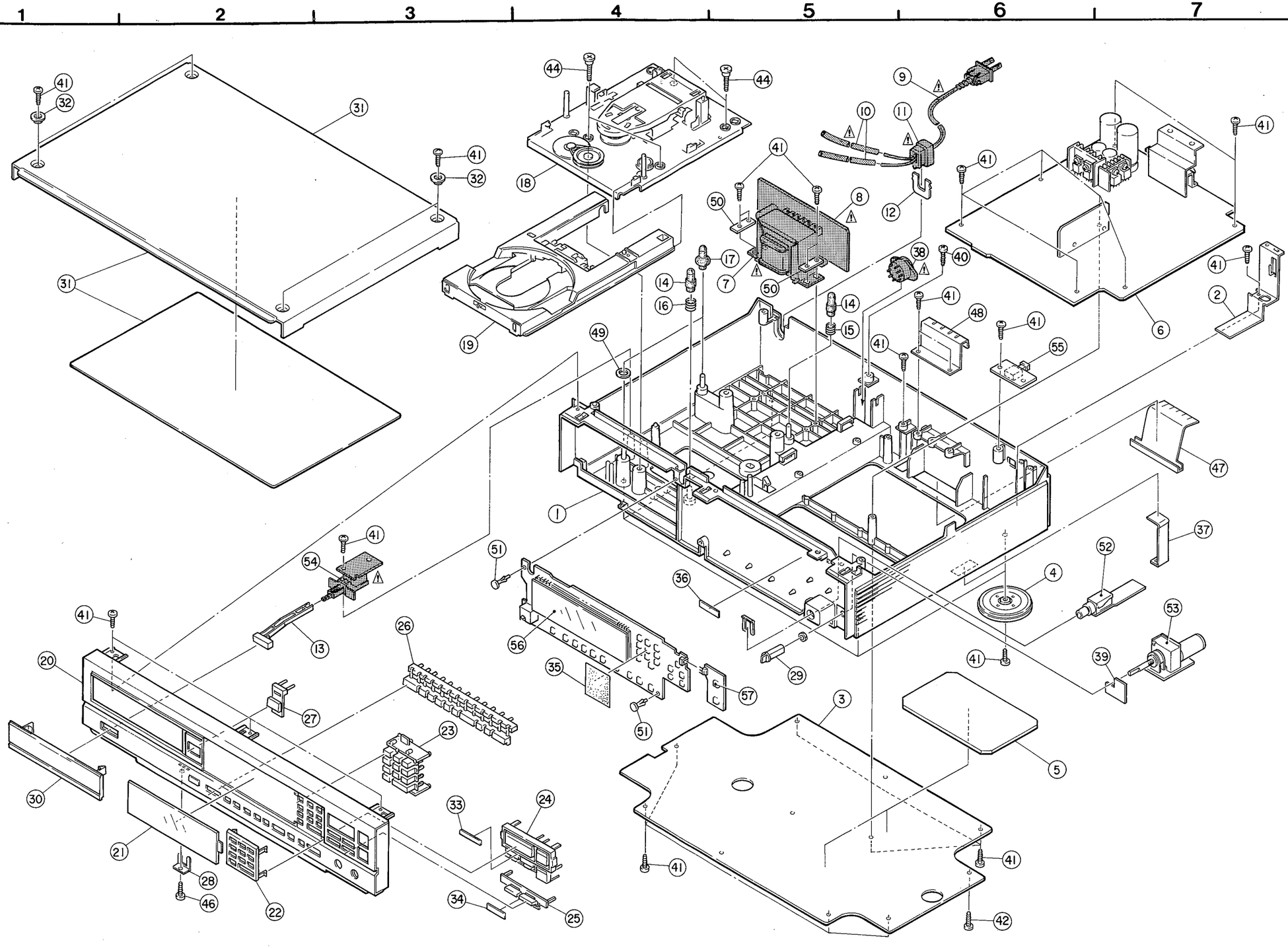
Ref. No.	Part No.	Part Name	Remarks
C521～523	2538014003	CK45F2GAC103M	0.01 μF/400VAC
CH501	2398019002	LINE FILTER COIL	
	2123323002	POWER SW	
	2042267003	9P NH-SCN CONNECTOR CORD	
	4150299000	CONDENSER COVER	
F1	2061031032	FUSE	(0.16A)
	2020022008	FUSE HOLDER	

⚠KU-578G LINE FILTER UNIT (Canada model)

Ref. No.	Part No.	Part Name	Remarks
C521～523	2538014003	CK45F2GAC103M	0.01 μF/400VAC
CH501	2398019002	LINE FILTER COIL	
	2123323002	POWER SW	
	2042267003	9P NH-SCN CONNECTOR CORD	
	2020022008	FUSE HOLDER	
F2,3	2061039018	FUSE 0.8A	

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

EXPLODED VIEW



PARTS LIST OF EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks
1	1031056200	CHASSIS	
1	1031056323	CHASSIS	Asia
2	4122319002	EARTH BRACKET	
3	1050746106	BOTTOM COVER	
4	1040162101	INSULATOR ASS'Y	
5	4030047000	BOTTOM WEIGHT	
6	2U-1560	SERVO & SIG. UNIT	
6	2U-1627	SERVO & SIG. UNIT	U.S.A. Only
⚠ 7	2335634000	POWER TRANS	Europe, Australia, U.K.
⚠ 7	2335633001	POWER TRANS	U.S.A., Canada
⚠ 7	2335635009	POWER TRANS	Asia
⚠ 8	KU-578B	LINE FILTER UNIT	Europe
⚠ 8	KU-578F	LINE FILTER UNIT	Australia
⚠ 8	KU-578D	LINE FILTER UNIT	U.K.
⚠ 8	KU-578C	LINE FILTER UNIT	U.S.A.
⚠ 8	KU-578G	LINE FILTER UNIT	Canada
⚠ 8	KU-578E	LINE FILTER UNIT	Asia
⚠ 9	2062002031	AC CORD	Europe
⚠ 9	2062025005	AC CORD	Australia
⚠ 9	2062024006	AC CORD	U.K.
⚠ 9	2062061001	AC CORD	U.S.A., Canada
⚠ 9	2006031026	AC CORD	Asia
⚠10	4158036003	PVC TUBING	Asia
⚠11	4450056008	CORD BUSH	
12	4122008012	BUSHING PLATE	
13	1130882003	P.SW.LEVER ASS'Y	
14	4620078104	DAMPER	
15	4630556001	SPRING(A)	
16	4630553004	SPRING(B)	
17	4620067209	BUSHING	
18	FG-760	CD MECHA UNIT	
19	4310261108	LOADER FRAME ASS'Y	
20	1460908107	FRONT PANEL ASS'Y	
21	1430532105	WINDOW	
22	1140104108	TEN KEY FRAME	
23	1130994108	TEN KEY ASS'Y	
24	1460869204	KNOB CAP ASS'Y	
25	1130936205	MANUAL KNOB ASS'Y	
26	1130928103	KNOB SERIES	
27	1130993002	OP/CL KNOB ASS'Y	
28	4122320004	F. PANEL EARTH PLATE	
29	1120475035	H/P KNOB	
30	4250199000	LOADER PANEL	
31	PTO1A19	TOP COVER ASS'Y	
32	1460772003	TOP COVER WASHER	
33	1290098009	ENBI SHEET	
34	1290098012	ENBI SHEET	
35	1220142006	HIMERON SHEET	
36	1290098025	ENBI SHEET	
37	4140454101	SHILDED PLATE(D)	
⚠ 38	2123315023	VOLTAGE SELECTOR	Asia
39	1290099008	H/P SPACER	
40	4737501027	3×16 CBTS(P)-Z	
41	4737508017	3×10 CBTS(P)-B	
42	4737508033	3×14 CBTS(P)-B	
44	4737514001	SPECIAL SCREW	
46	4737002021	3×8 CBTS(S)-B	
47	4140451007	SHIELDED PLATE(B)	
48	4140452103	SHIELDED PLATE(C)	
49	1250032005	FLOAT SPACER	
50	4030048009	WASHER	
51	4770096007	PUSH RIVET	
52	2048209007	H/P JACK	2U-1560-4
53	2110513207	H/P VOLUME	VR403
⚠ 54	2123336002	POWER SWITCH	KU-578A-1
55	2690052000	TOTX 172	2U-1560-6
56	3934046001	FL TUBE	2U-1560-2
57	2124388004	TACT SWITCH	2U-1560-5

PARTS LIST OF PACKING & ACCESSORIES

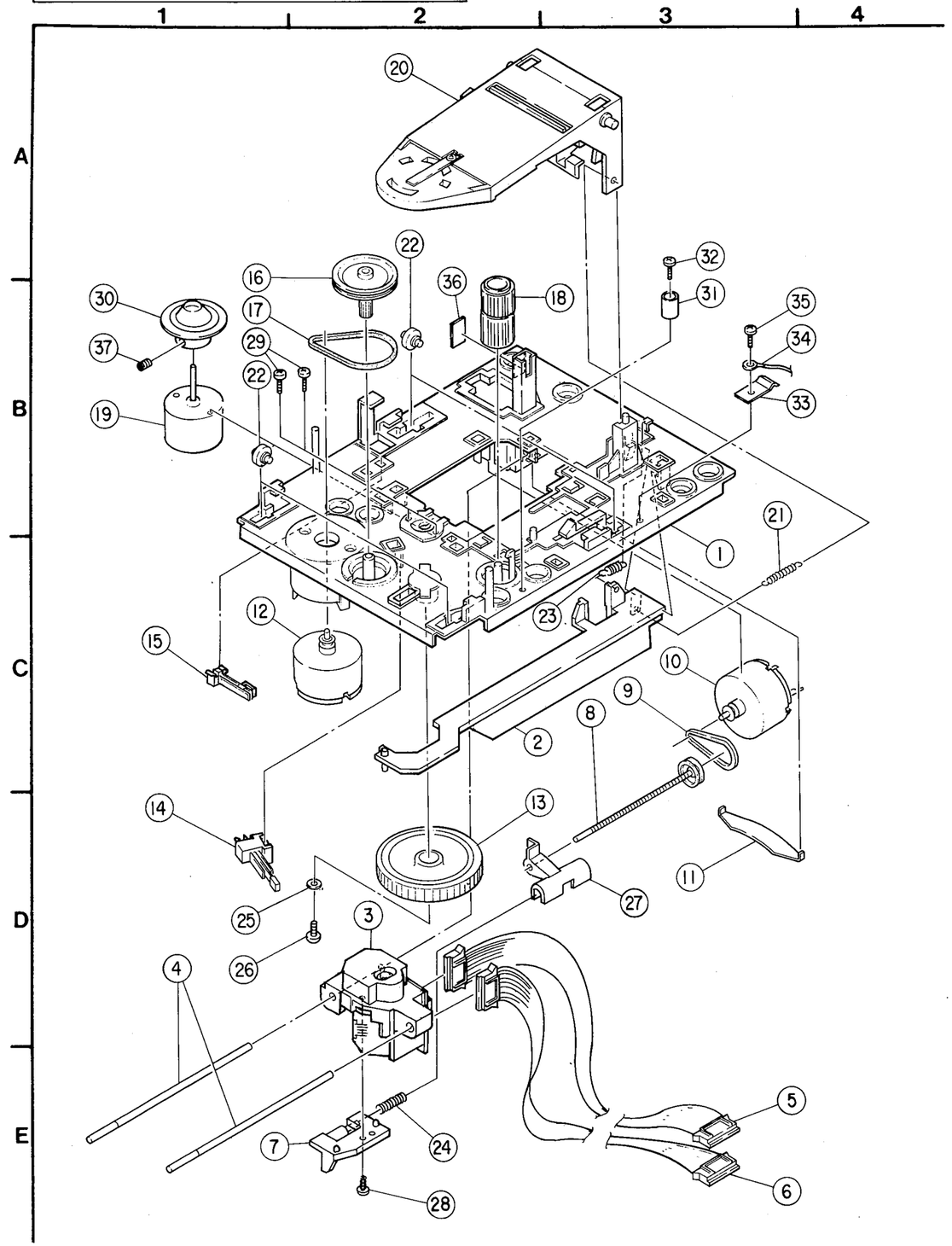
Ref. No.	Part No.	Part Name	Remarks
	5011209015	CARTON CASE	
	5030646002	CUSHION	
	5040092060	STYRENE PAPER	
	2032195004	2P PIN CORD	
	4990087003	RC 205	
	5111605001	INST. MANUAL	U.S.A.
	5111606000	INST. MANUAL	Except U.S.A
	5111607009	SWEDISH MANUAL	Europe
	5131320007	EK RATING SHEET	Australia, U.K.
	5131319005	E2 RATING SHEET	Europe
	5131318006	E3 RATING SHEET	Canada
	5131321006	E1 RATING SHEET	Asia
	5131348005	EU SERIAL NO. SHEET	U.S.A.
	5150418000	DAI WARRANTY HOME	U.S.A.
	5150388004	DCI WARRANTY	Canada
	2033667007	PLUG ADAPTER	Asia

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

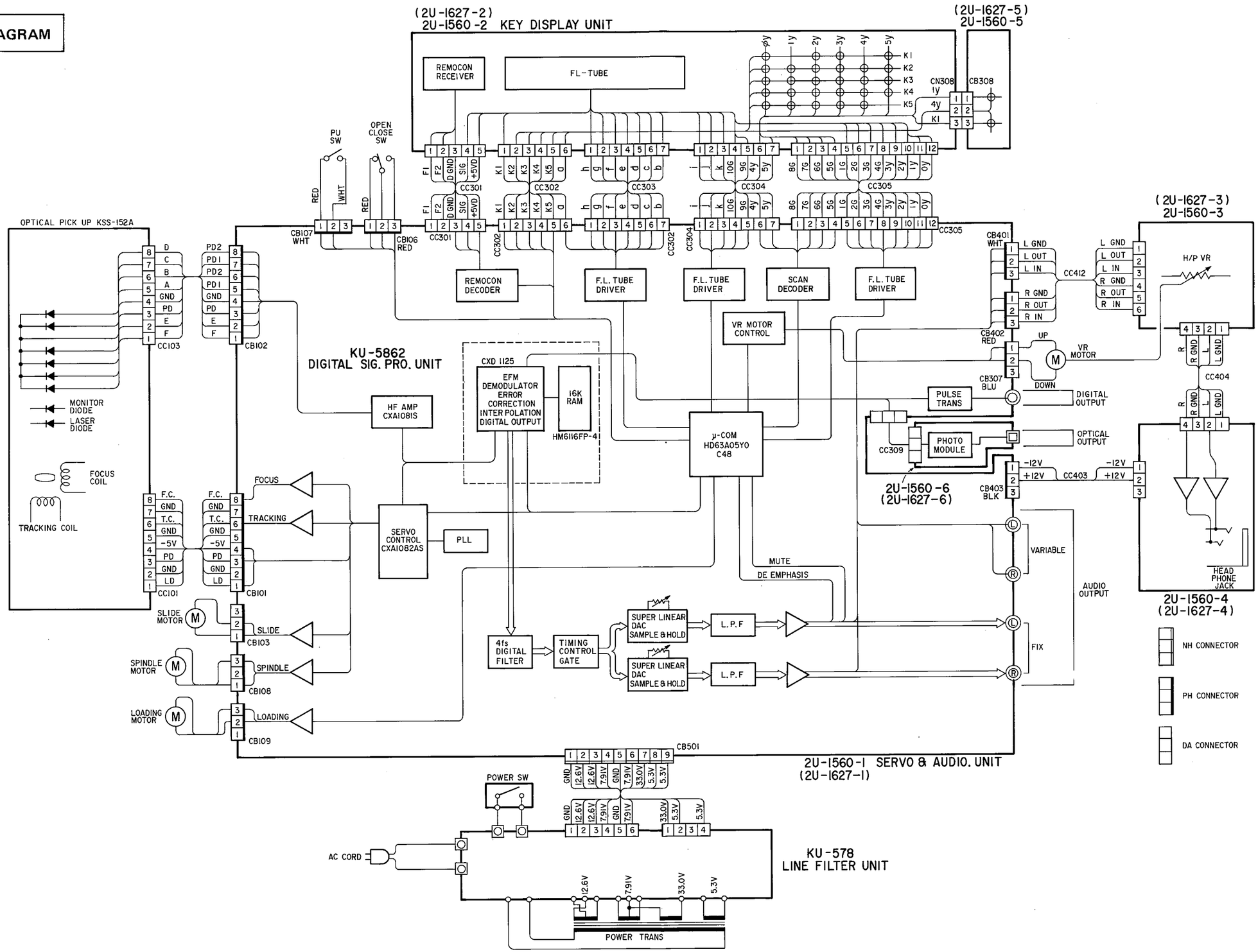
PARTS LIST OF FG-760 MECHA UNIT

Ref. No.	Part No.	Part Name	Remarks
1	4110671406	BASE PLATE	
2	4350108409	SLIDER	
3	4999001006	LASER P.U.(KSS-152A)	
4	4310224103	SLIDE SHAFT (M)	
5	2042159014	8P PH CON. CORD	RED
6	2042159001	8P PH CON. CORD	WHITE
7	4359001002	P.U. ARM	
8	PS01A32	SHAFT SCREW SUB ASS'Y	
9	4230044036	BELT	
10	PS01A33	SLIDE MOTOR SUB ASS'Y	
11	4122013007	MOTOR PLATE	
12	PL01A39	LOADING M.SUB ASS'Y	
13	4240115308	CONTROL GEAR	
14	2124613009	LEAF SW (O/C)	
15	2124675005	LEAF SW (PU)	
16	4240110002	PULLEY GEAR	
17	4230048002	BELT	
18	4240126009	PINION GEAR ASS'Y	
19	PS01A37	SPINDLE MOTOR SUB ASS'Y	
20	4330500108	CLAMPER ARM. G. ASS'Y	
21	4630467006	SLIDER SPRING	
22	4250170003	SLIDER ROLLER	
23	4630566004	SPRING (BIAS)	
24	4630527001	SPRING (DRIVE)	
25	4751106042	WASHER	
26	4737508017	3×10 CBTS(P)-B	
27	4359002108	DRIVE NUT	
28	4713822005	2×6 CBTS(2)-B	
29	4713102013	2×5 CBTS-Z	
30	4210480102	TURN TABLE	
31	4430772001	COLLAR	
32	4737006027	3×10 CBTS(S)-B	
33	4140468003	LOADER SPACER	
34	2030241060	1P CONTACT ASS'Y	
35	4737002005	3×6 CBTS(S)-Z	
36	1220143005	BASE SPACER	
37	4744300004	2.6×4 BSS(A)	

EXPLODED VIEW OF FG-760 MECHA UNIT

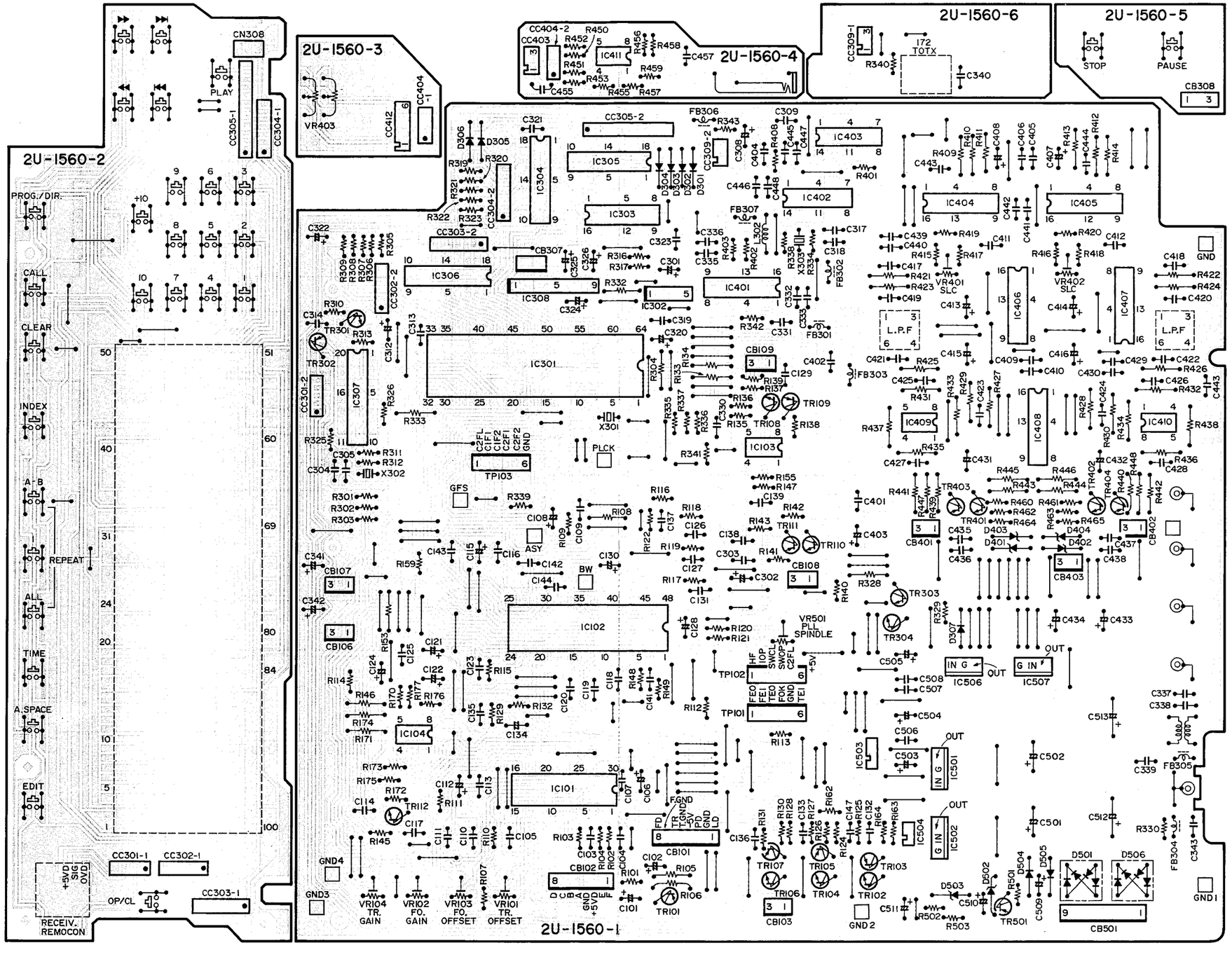


WIRING DIAGRAM

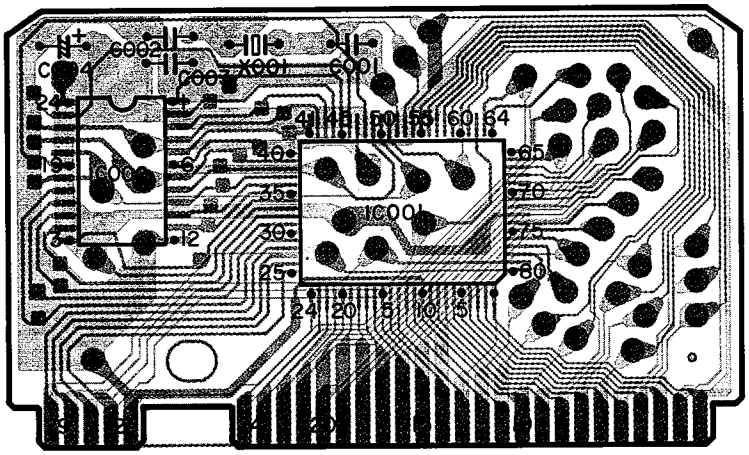


P.W. BOARD

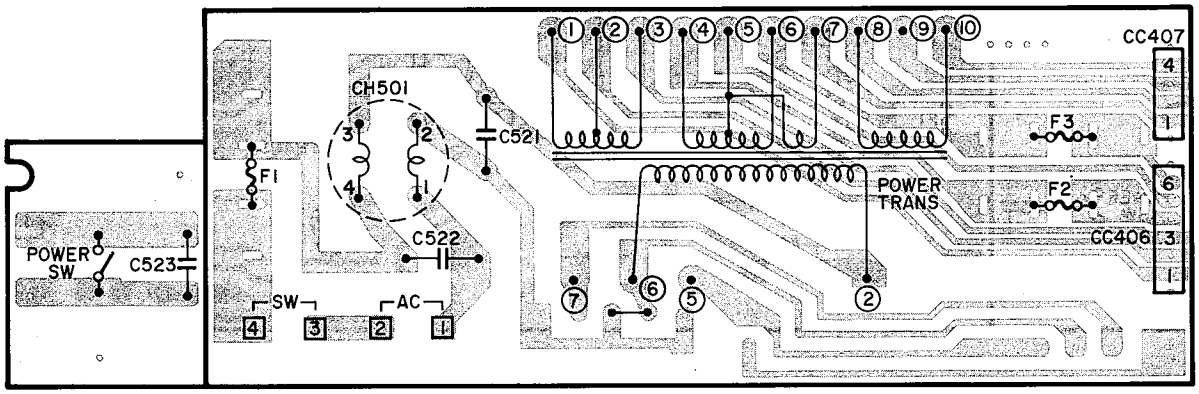
2U-1560/1627 SERVO & SIG. PRO. UNIT



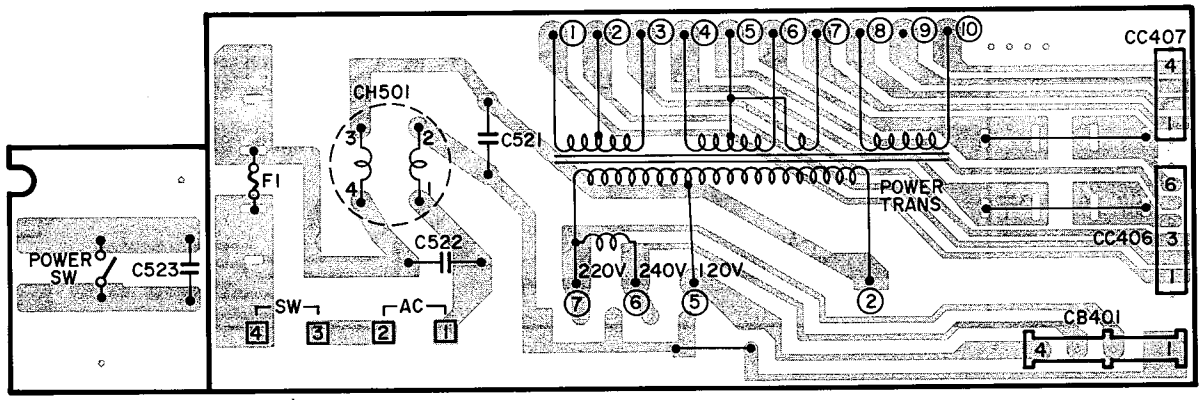
KU-5862 DIGITAL SIG. PRO. UNIT



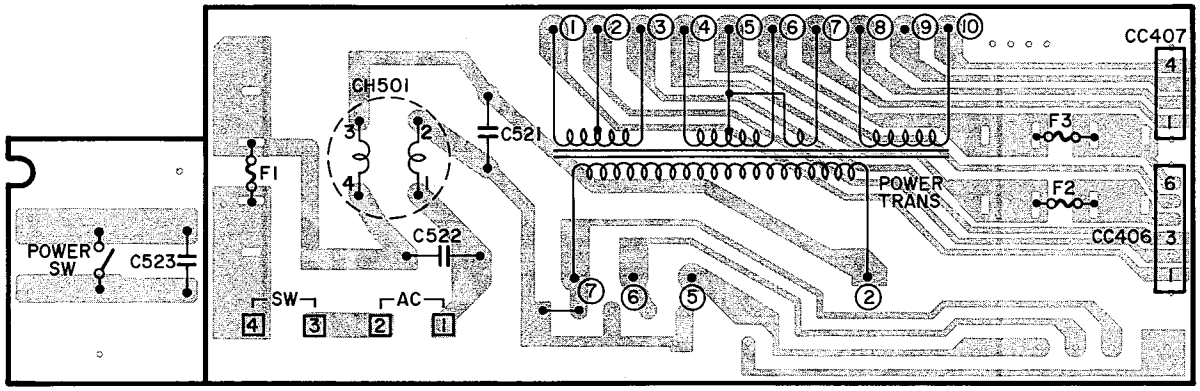
KU-578D LINE FILTER UNIT (U.K. model)



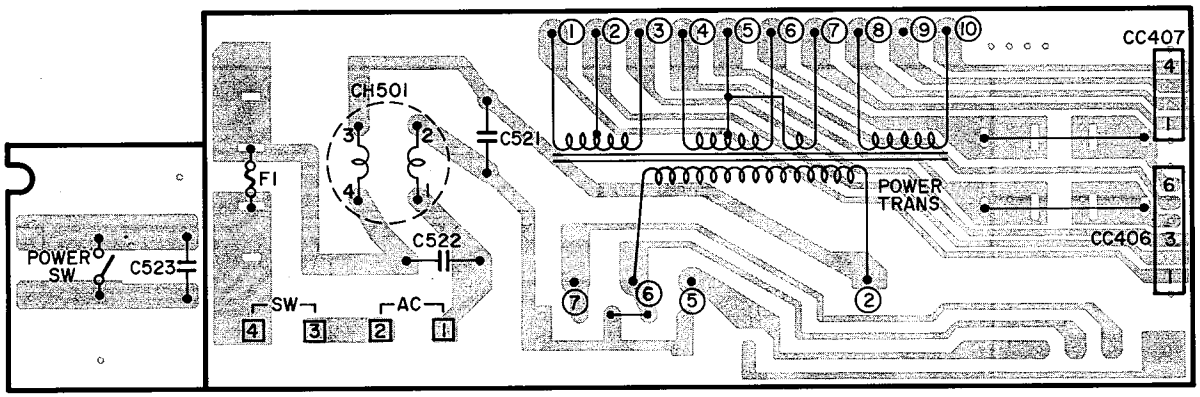
KU-578E LINE FILTER UNIT (Asia model)



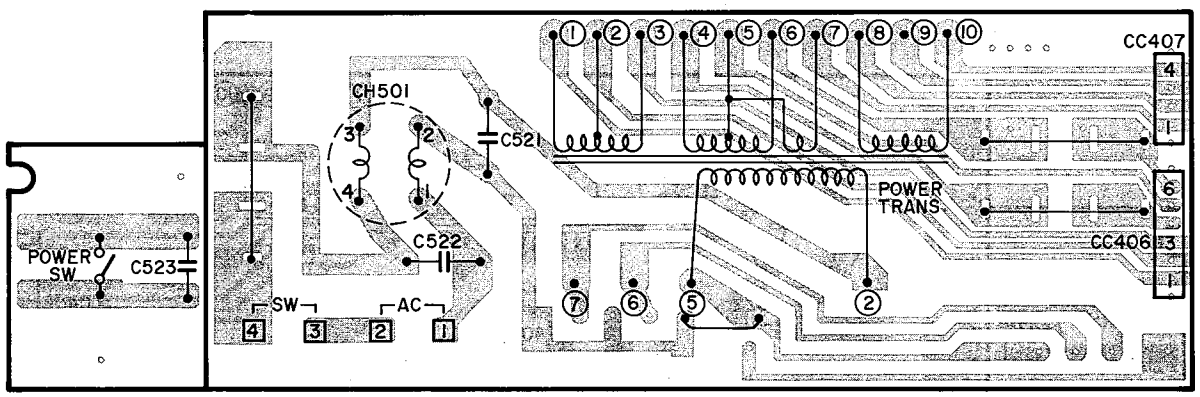
KU-578B LINE FILTER UNIT (Europe model)



KU-578F LINE FILTER UNIT (Australia model)

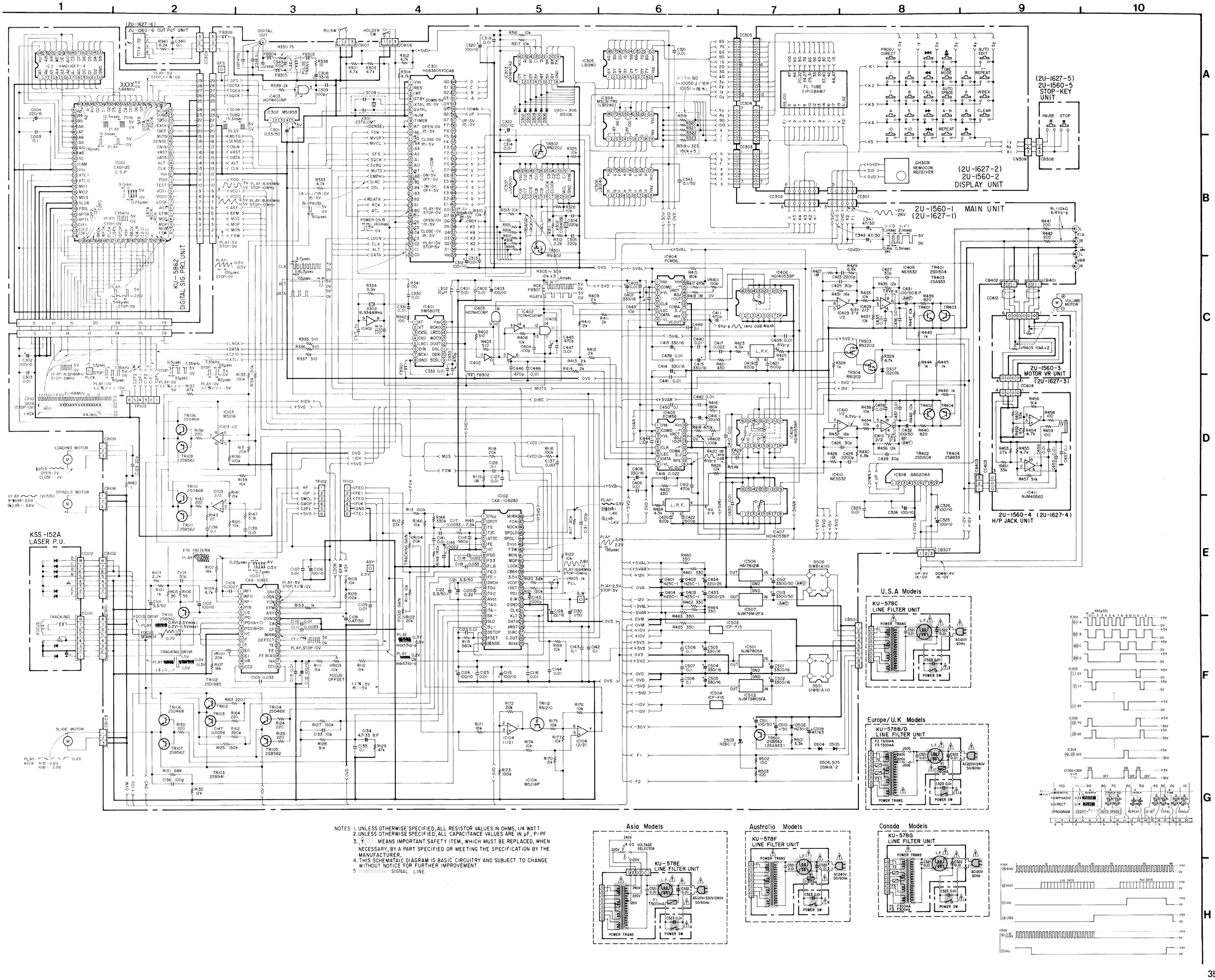


KU-578C/G LINE FILTER UNIT (U.S.A. /Canada model)



Note: Fuse (500mA) is employed for Canada model on F2 and F3.

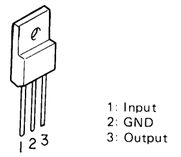
SCHEMATIC DIAGRAM



NOTES 1. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES IN OHMS, 1/4 WATT
2. UNLESS OTHERWISE SPECIFIED, ALL CAPACITANCE VALUES ARE IN μF, P: PF
3. ⚠ MEANS IMPORTANT SAFETY ITEM, WHICH MUST BE REPLACED, WHEN NECESSARY, BY A PART SPECIFIED OR MEETING THE SPECIFICATION BY THE MANUFACTURER.
4. THIS SCHEMATAIC DIAGRAM IS BASIC CIRCUITRY AND SUBJECT TO CHANGE WITHOUT NOTICE FOR FURTHER IMPROVEMENT
5. ▒▒▒ SIGNAL LINE

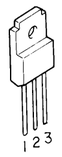
SEMICONDUCTORS

● IC



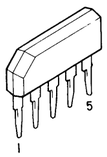
1: Input
2: GND
3: Output

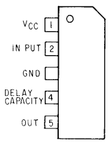
NJM7805A
HA17812W



1: Gnd
2: Output
3: Input

NJM79M05FA
NJM79M12FA





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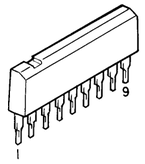

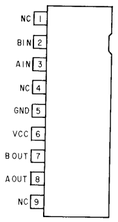

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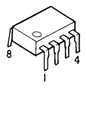

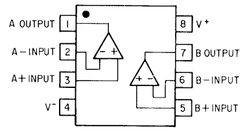

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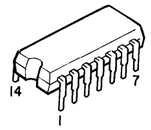

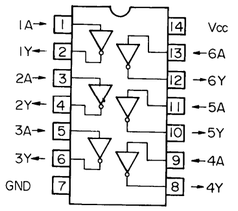

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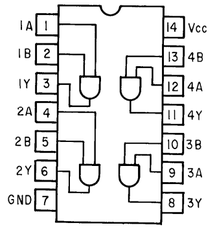

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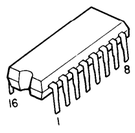

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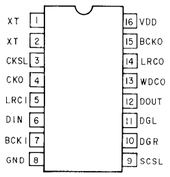

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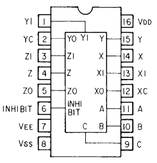

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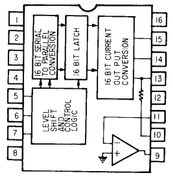

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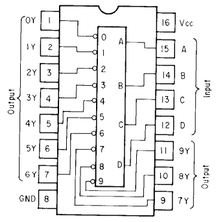

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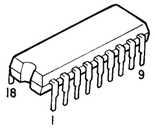

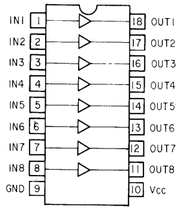

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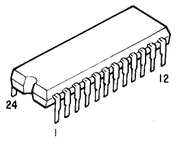

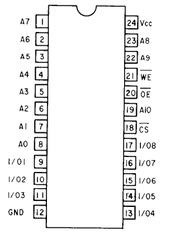

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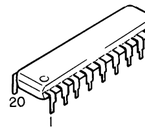

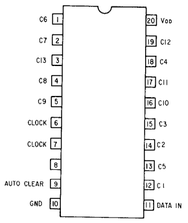

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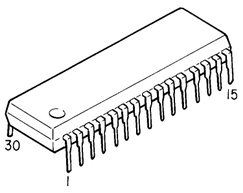

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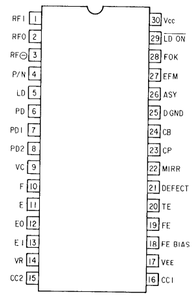

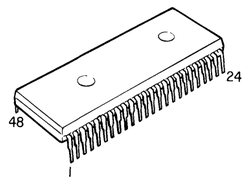

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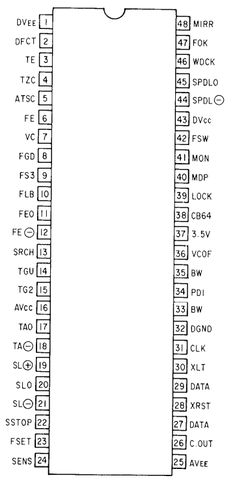

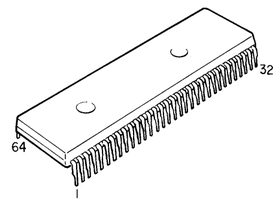

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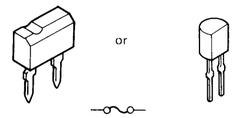
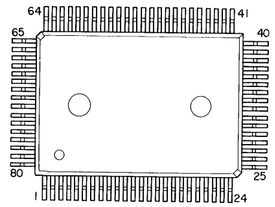


ICP-F15



CXD1125

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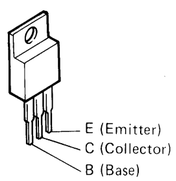
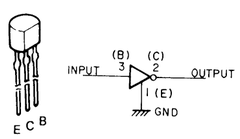


2SB941A(P/Q)
2SD1985(P/Q)

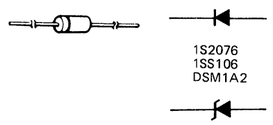
2SA933(Q)
2SD1504(E/F)

2SB562
2SD468(C)



RN1202(10K-10K) NPN
RN1210(4.7K-00) NPN
RN2202(10K-10K) PNP

● DIODES



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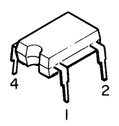
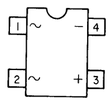
HZ30-2



S1WB(A)10



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TLX: JAPANOLA J22591
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Printed in Japan 801 BU 0094